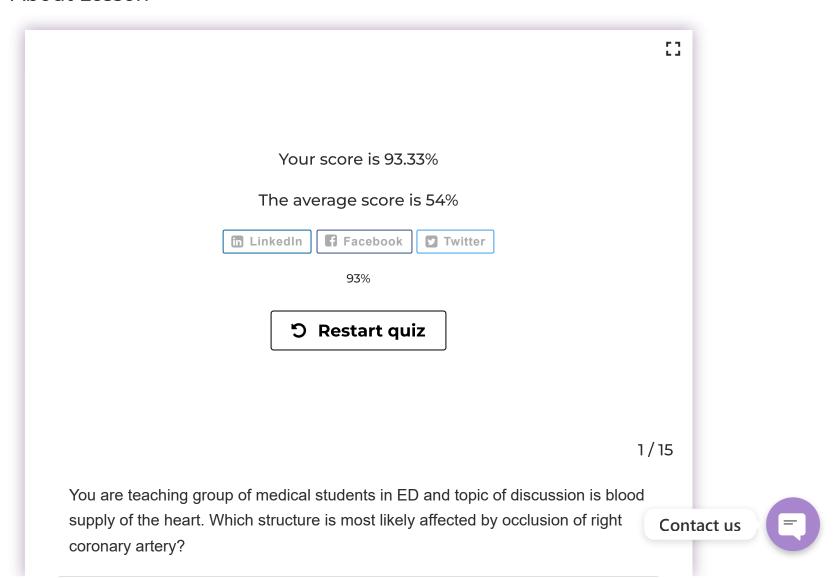
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🗐 Overview 🕞

E Comments

About Lesson



A. Bundles of His
B. Left ventricle
C. Left atrium
D. SA node
E. Interventricular septum

Cardiac blood supply:

1: The Right coronary artery supplies:

- The right atrium and most of right ventricle
- The sinoatrial and atrioventricular node
- Posterior interventricular artery, also known as the posterior descending artery (PDA), is a branch of the right coronary artery supply posterior 1/3 of interventricular septum and posterior aspect of right and left ventricle. Most common artery infracted in posterior wall MI

Note: Occlusion of right coronary artery can result into ischemia of SA and AV node and subsequently bradycardia or heart block (Recall)

2: The left coronary artery supplies via main branches below:

Anterior interventricular branch (LAD)



• LCX

Anterior interventricular branch	 Right and left ventricles, anterior two- thirds of interventricular septum
Left circumflex branch.	Left atrium and left ventricle

<u>High yield:</u>

Localization of lesion in ST elevation MI and occluded coronary artery.

Only remember myocardial area and occluded coronary artery.

Easy to remember:

- Septal and Anterior wall MI: LAD (Anterior interventricular branch) occluded.
- Lateral wall MI: LCX occluded.

Affected myocardial area	Leads with ST- elevation	Occluded coronary Arter	
 Septal 	V1-V2	LAD	
 Anterior 	V3-V4 Or V1-V4 R ST-dep in II, III, aVF	LAD	
Lateral	V5-V6, I, aVL	LCX	
Anteroseptal	V1-V4	LAD	
Anterolateral	V3-V6,I,aVL (R II, III, aVF)	LAD or LCX	
 Inferior 	II, III, aVF (R I, aVL)	RCA	
Posterior	R v2-v3 (V7-V9)	RCA	
Right ventricular	III>11 V1, V4R (R v2)	RCA	
 Subendocardial 	aVR (R V2-V6 I, II, aVF)	Left main coronary Artery	



2/15

A 55 Years old male with history of hypertension came into the ED with a complaint of sudden severe abdominal pain. After initial assessment at triage, you suspect abdominal aortic aneurysm. Which one of the following is the most common site of abdominal aortic aneurysm?

- A. Suprarenal aorta
- B. Infrarenal aorta
- C. Below diaphragm
- D. At the level of umbilicus
- E. Epigastrium

The most common location of arterial aneurysm formation is **the abdominal aorta, while** the most common site of abdominal aortic aneurysm is infrarenal aorta (90 to 99%)

3/15

A 25 Years old male presents to the ED with complaints of fever, photophobia, and neck stiffness. You suspect meningitis. Which of the following is the feature of **Neisseria meningitis?**



A. Gram +Ve diplococci

B. Gram +Ve rod

C. Gram –Ve diplococci

D. Gram -Ve rod

E. Gram +Ve Cocco bacilli

Neisseria meningitis is gram negative encapsulated diplococci causing Neisseria meningitis and meningococcal sepsis

4/15

A 25 Years old male presents to the ED with complaints of fever, photophobia, neck stiffness, and non-blanching skin rash. What is the most likely Causative agent?

A. Streptococcus pyogenes

B. Streptococcus aureus

C. Neisseria meningitis





D. Hemophilus influenza

E. E-Coli

Neisseria meningitidis is the most common cause of bacterial meningitis. Meningococci/Neisseria meningitidis are gram-negative diplococci that cause meningitis and meningococcemia. Symptoms, usually severe, include headache, nausea, vomiting, photophobia, lethargy, rash, multiple organ failure, shock, and disseminated intravascular coagulation. Diagnosis is clinical, confirmed by culture

5/15

A 25 years old male patient with a history of trauma presents into the ED with complaint of pain in epigastrium radiating to the back. Which of the following is the segmental innervation of the pancreas?

A. T6 -T10 🗸

B. L1-L2

C. T4-T8

D. T4 -T10

E. L2-L4



Innervations:

- The segmental level of innervation of pancreas= T6-T10
- Gallbladder=phrenic(C3-C5)
- Ascending and transverse colon= fibers travel through lesser splanchnic nerve to =T10-T11 spinal cord segment
- Descending and sigmoid colon=pain fibers travel through lumber splanchnic nerve to= L1 and L2 spinal segments
- Ureter=Sympathetic supply from inferior hypogastric plexus
- parasympathetic supply from pelvic splanchnic nerve(S2-S4)
- Visceral afferent fibers follow sympathetic fibers to enter in spinal cord
 via =T10-L1 nerve fibers
- Bladder= Efferent parasympathetic fibers from pelvic splanchnic nerve=S2 to S4
- ovary=sympathetic fibers of ovarian and lumber splanchnic nerve to cell bodies in the = T10-T12 and L1 spinal sensory ganglion
- Testes= visceral afferent fibers follow the sympathetic fibers to=T10-L1
- Rectum= visceral afferent fibers follow parasympathetic supply to =S2-S4 sensory ganglia.

6/15

A 45-year-old male sustained lacerated wound on his right knee 2 days back and came into ED with a Complaint of Severe pain in his right knee associated with fever and swelling of joint. You suspect septic arthritis. what is the single most causative agent in this case?

A. Staph Aureus 🕡



B. E- Coli

C. Staph pyogenes

D. Streptococcus

E. S.Epidermidis

Septic arthritis is an infection of any kind that finds its way into joint space, it is a most rapid and destructive joint disease, acute onset of monoarticular arthritis with pain swelling, and warmth, the knee is the most common site others include the hip, wrist, shoulder, and ankle.

the most common type of bacteria that causes septic arthritis is called staphylococcus aureus. others include streptococcus, gram-negative rods,

Neisseria Gonorrhea causes septic arthritis in sexually active young adults (Recall)

7/15

A 23 years old pregnant woman from southern Vietnam came into the ED with complaint of fever with chills for 2 days. You suspect malaria. What is the antimalarial drug of choice for this patient?

A. Quinine



QUIZ: 1 MRCEM EXPERT
B. Primaquine
C. Doxycycline
D. Chloroquine
E. Clindamycin
Quinine is the antimalarial drug of choice in pregnancy; however, chloroquine should be considered in non-falciparum malaria while those areas where chloroquine is resistant especially southern Vietnam Quinine is best given in pregnancy

8/15

A 32 Years old lady came into the ED with Complaint of pain in the foot. She gives history of taking certain antibiotics prescribed by her GP. Which of the following antibiotics class are associated with tendon injury?

A. Cephalosporins

B. Quinolones

C. Macrolides

D. Aminoglycosides



E. Tetracyclines

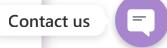
- Tendon damage and QT interval prolongation both are the common side effects of quinolones
- QT prolongation leads to Torsades de pointes

High Yield:

Summary Of Drugs And Their Side Effects



	Drugs		Side effects
•	Co-Amoxiclav		Obstructive jaundice or cholestatic jaundice
	Metoclopramide	•	Extra pyramidal symptoms and parkinsonian like symptoms
	Antimuscarinic Drugs (Hyoscine)	•	General side effects: Dry mouth, Urinary retention and blurred vision
•	Loop diuretics (Furosemide) and thiazide diuretics	•	Hypokalemia, Metabolic alkalosis and hyperuricemia. In addition, Thiazides causes hyperglycemia too.
•	K+ Sparing diuretics (Spironolactone)		Hyperkalemia, Metabolic acidosis and gynecomastia
	Ace inhibitors (Captopril)		Persistent dry cough
•	Ca+ Channel blockers	0.0100	Dipyridamole (Amlodipine, Nifedipine): Peripheral edema Non-Dipyridamole (Verapamil): Constipation
•	Aspirin		Reyes syndrome
	Salicylate poisoning	100	Respiratory alkalosis (Hyperventilation initially) later on metabolic acidosis
	Hydrocortisone	•	Hyperglycemia, Cushing syndrome, Myopathy and osteoporosis
	Lithium	•	Leukocytosis (Commonly), Diabetes insipidus, tremor Hypothyroidism, Hyperreflexia and muscle twitch
	Traumadol	•	Constipation, Vomiting
	Fluroquinolones (Ciprofloxacin)		Tendon rupture, Torsade's de pointes
	Aminoglycosides (Gentamycin, streptomycin)	•	Nephrotoxic, Ototoxic and neurotoxic
	Vancomycin	•	Red man syndrome, Nephrotoxic and Ototoxic
	Allopurinol	•	Steven Johnson syndrome
	Tetracyclines		Teeth discoloration
	Beta-2 Agonist (Salbutamol)		Hypokalemia
	Nitrous oxide	•	Vitamin B12 Deficiency and megaloblastic anemia
•	4 c's (Ceftriaxone, clindamycin, ciprofloxacin and Co-amoxiclav		Clostridium difficle colitis
	Isoniazid	•	Peripheral neuropathy
•	Macrolides (Erythromycin), Aminoglycosides and Quinolones (Cipro)		QT interval prolongation leads to Torsades de pointes
•	Suxamethonium		Hyperkalemia
	Mefenamic acid		Haemolytic anemia



9/15 Which of the following diet is a rich source of calcium? A. Broccoli B. Sun flower C. Broccoli D. Soyabean E. Tomato Rcem key: soyabean is a rich source of calcium Dairy products, leafy vegetables, and Soybean is rich in calcium 10 / 15 A 45-year-old male was found unconscious at home and was brought into the ED by paramedics. On initial assessment at triage, his BM was 1.5mmol/l. According to hypoglycemia management guidelines what initial treatment should be given in unconscious patient:

A. Wait for iv-line access and give iv 10 % dextrose

B. IM Pabrinex

C. 70 to 80 ml of 50% glucose

D. 1mg IM glucagon



E. 5% dextrose orally

IM glucagon should be given initially in an unconscious patient while those patients who are alert and able to swallow oral dextrose should be given

NOTE: IM pabrinex considered the first line in Wernicke's encephalopathy (Recall)

11 / 15

A 30 years old male with a history of RTA was brought into the ED with a complaint of irregular breathing. Which of the following muscle is the accessory muscle of expiration?

A. Internal intercostal muscle

B. Sternocleidomastoid

C. Diaphragm





D. External intercostal muscle

E. Transversus abdominus



Diaphragm: Normal quiet inspiration

Normal expiration: Passive recoil of lungs

Inspiration: External intercostal muscle

Expiration: Internal intercostal muscle

Accessory muscle of inspiration: Sternocleidomastoid

Accessory muscle of expiration: Transversus abdominal muscles

Forced expiration: Internal intercostal muscle and **rectus abdominus** (RECALL)

12 / 15

A 65 Years old woman presents with a painful shoulder after falling on the ground. On examination and rotator cuff assessment she is unable to perform the Lift Off test. Which rotator cuff muscle has been most likely injured?

A. Supraspinatus

B. Teres minor



C. Subscapularis

D. Teres major

E. Infraspinatus

Assessment of rotator cuff muscles

Supraspinatus	Empty Can test: In this test, the patient is tested at 90 degrees elevation in the scapular plane and full internal rotation and pronation of the forearm with thumbs pointing downwards the patient resists downward pressure exerted by the examiner at the patients elbow or wrist
Infraspinatus	<u>Infraspinatus test:</u> Patient arm fully adducted with elbow flexed to 90 degrees . The examiner will apply an internal rotation force along the patient's forearm while the patient resists. The test is positive if the patient experiences pain or weakness.
Teres minor	<u>Hornblower test:</u> The examiner places the patient's arm to 90 ° in the scapular plane and flexes the elbow to 90°. The patient is then asked to externally rotate against resistance. The test is positive if the patient is unable to perform external rotation.
Subscapularis	<u>Lift-off test:</u> Position the patient in full medial rotation with the dorsum of the hand on the lower back. Ask the patient to lift their hand away from their back against resistance. Test is positive if patient has pain or weakness.

Note: Supraspinatus is the most commonly injured rotator cuff muscle and helps to initiate abduction from 0 degree to 15 degrees (RECALL) and then assist the deltoid with continued abduction.



13 / 15

A 45-year-old male sustained a lacerated wound on his right knee 2 days back and came into ED with a Complaint of Severe pain in his right knee associated with fever and swelling of the joint. Gram staining revealed gram +ve cocci in clusters what is the single most causative agent in this case?

A. Staph pyogenes

B. E- Coli

C. S.Epidermidis

D. Streptococcus

E. Staph Aureus 🎻

Staph aureus is gram +Ve diplococci in clusters causing septic arthritis

14 / 15

A 32 Years old male sustained a dirty wound on his leg while running on the ground. Which of the following pathogen is conditional causing infection after puncture wounds?

A. Staphylococcus aureus





B. E.Coli

C. Pseudomonas aeruginosa



D. Neisseria gonorrhoeae

E. Treponema pallidum

Pathogen and Types: (High Yield)

Pathogen	Examples
Obligate : Always associated with disease and cannot survive outside of human body	HIV, Mycobacterium tuberculosis, Treponema pallidum, Neisseria gonorrhoeae
Conditional : Cause disease if certain conditions are met e.g., Neisseria meningitidis, a normal nasopharynx commensal, may cause meningitis by direct or haematogenous spread.	Bacteroides fragilis, Neisseria meningitidis, Staphylococcus aureus
Opportunistic: Cause disease when host defense system is compromised (Immunocompromised patients)	Candida albicans, Pneumocystis jiroveci, Pseudomonas aeruginosa

15 / 15

A 43 years old undergone surgery of posterior part of the neck after which he lost sensation around the clavicle. Which of the following dermatome is best localized on the supraclavicular region?



E. C3			
D. C2			
C. C5			
B. C4			
A. T2			

<u>High Yield:</u> Dermatomes of Upper Limb:

Dermatome: A dermatome is defined as 'a strip of skin that is innervated by a single spinal nerve and clinically very important and help in diagnosis of spinal cord injury

Dermatome	Landmark	
C2	Occipital Protuberance	
C3	Supraclavicular Fossa at mid clavicular line	
C4	Acromioclavicular Joint	
C5	Lateral Antecubital Fossa	
C6	Thumb	
C7	Middle Finger	
C8	Little Finger	
T1	Medial Antecubital Fossa	
T2	Apex of Axilla	



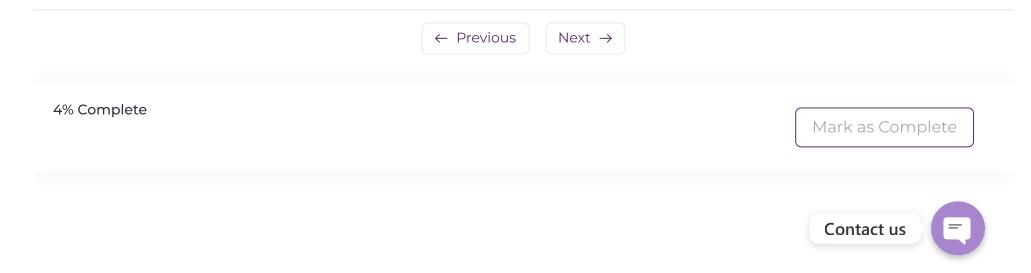
Myotomes and associated movements:

Myotome: Group of muscles innervated by a single spinal nerve

C5	Elbow flexion	
C6	Wrist extension	
C7	Elbow extension	
C8	Finger flexion	
T1	Finger abduction	

Reflexes of upper Limb:

Biceps	C5 – C6	Biceps brachii
Supinator	C6 – C7	Brachioradialis
Triceps	C7 – C8	Triceps brachii



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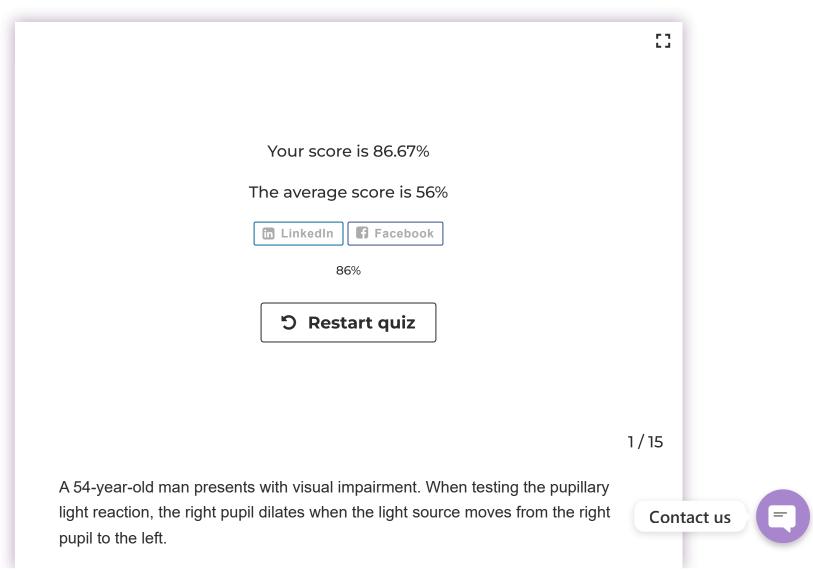
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10/29/23, 10:03 PM QUIZ: 2 | MRCEM EXPERT

Which nerve is likely to be abnormal?

A. Right oculomotor nerve

B. Right optic nerve



C. Left optic nerve



D. Ophthalmic division of the left trigeminal nerve

E. Left oculomotor nerve

In this question examiner is more focused on left eye that means when light source is tested in left eye, left eye do not constrict that means loss of ipsilateral direct pupillary reflex and right pupil dilation refers to loss of contralateral consensual pupillary light reflex

In Complete transection of optic nerve:

- loss of ipsilateral direct pupillary reflex
- loss of contralateral consensual pupillary light reflex

2/15

You are asked to perform ascitic tap on a CLD patient and teach a group of medical students. You ask medical students what is the site to perform ascitic tap.

A. Left lower quadrant



B. Right subphrenic space

C. Left subphrenic space

D. Right perihepatic space



E. Left perihepatic space

- Ascites or hemoperitoneum accumulates in Morrisons pouch or Hepatorenal recess or Right perihepatic space which is lowest space in peritoneal cavity in Supine position
- Subphrenic or right subphrenic (pus from appendicitis or ruptured duodenal ulcer accumulate here

3/15

30 years old man is brought into the Ed by paramedics with a gunshot wound on his abdomen. On laparotomy retroperitoneal hemorrhage found. Which of the following structures is the most likely source of bleeding?

A. First part of duodenum

B. Liver

C. Spleen



E. Sigmoid colon

SADPUCKER useful mnemonic to remember retroperitoneal organs

- S: Suprarenal (adrenal) gland
- A: aorta/IVC
- **D:** duodenum (Second and third part)
- P: pancreas (except tail)
- U: ureters
- C: colon (ascending and descending)
- **K:** kidneys
- E: (o)esophagus
- R: rectum

4/15

A 25-year-old male with history of dysphagia to solid foods came with complaint of nausea and vomiting. The esophagus passes through diaphragm at which vertebral level?

A. T10 🗸

B. T12

C. T11

D. L2



E. T8

Opening	<u>Vertebra level</u>	<u>Contents</u>
Esophageal opening	T-10 (Recall)	Esophagus, anterior and posterior vagal trunks
Aortic opening	T-12	Aorta, thoracic duct (RECALL), Azygous and hemiazygos vein
Caval opening	T-8	Inferior vena cava (RECALL), Right phrenic nerve (RECALL)

5/15

A 60 Years old male known case of Diabetes mellitus presents into the ED with complaint of eye pain that's worsened by eye movement and loss of color vision. You suspect optic neuritis which one of the following conditions is strongly associated with it?

A. Diabetes Mellitus 🦹



B. Multiple sclerosis 🕡



C. Sarcoidosis

D. Crohn's disease

E. Hyperglycemia



Optic neuritis is an inflammatory demyelination of the optic nerve, and is strongly associated with multiple sclerosis.

6/15

A 54-year-old man presents with visual impairment. On examination right eye is fixed dilated and deviated downwards and outwards. Which of the following nerve is most likely affected?

- A. Ophthalmic division of trigeminal nerve
- B. Abducent nerve
- C. Optic nerve
- D. Trochlear nerve
- E. Oculomotor nerve



Depressed and abducted eye, diplopia on downwards movement, ptosis, fixed and dilated pupil with loss of accommodation, and abnormal pupillary light reflex are all clinical effects of injury of oculomotor nerve.



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Muscle	Nerve innervation	Function
Superior rectus	Oculomotor nerve	Elevation and medial rotation of eyeball
Inferior rectus	Oculomotor nerve	Depression, lateral rotation and adduction
Medial rectus	Oculomotor nerve	Adduction
Lateral rectus (LR6)	Abducent nerve	Abduction of eyeball (Horizontal diplopia (Recall)
Superior oblique (SO4)	Trochlear nerve	Depression, abduction and medial rotation of eyeball (Vertical diplopia)
Inferior oblique	Oculomotor nerve	Elevation, abduction and lateral rotation

Note: Orbital blowout fracture and diplopia on upward gaze is due to entrapment of inferior rectus muscle (RECALL)

7/15

A 10-year-old male presents to the ED with abdominal pain, vomiting and bleeding per rectum. After initial assessment and imaging is suggestive of Meckel's diverticulum. The blood supply of Meckel's diverticulum is from which of the following:



B. Inferior pancreaticoduodenal artery

C. Superior mesenteric artery

D. Inferior mesenteric artery

E. Gastroduodenal artery

Rich blood supply to Meckle's diverticulum is from Superior mesenteric artery

- Proximal to the major duodenal papilla supplied by the gastroduodenal artery (branch of the common hepatic artery from the coeliac trunk
- **Distal to the major duodenal papilla** supplied by the inferior pancreaticoduodenal artery (branch of a superior mesenteric artery)

8/15

A 30 years old man is brought into the Ed by paramedics with a lacerated wound on his abdomen. which of the following Structures is most likely affected by a tear of the superior mesenteric artery?

A. Only ascending colon

B. Sigmoid colon

C. Ascending and transverse colon



D. Transverse colon only

E. Transverse and descending colon

- The superior mesenteric artery supplies the midgut structures from the second part of duodenum including the caecum, appendix, ascending colon, and proximal two-thirds of the transverse colon.
- Inferior mesenteric artery supplies the descending colon and sigmoid colon.

9/15

A 24 years old female who is 3 months pregnant came into the ED with complaint of lower abdominal pain. You suspect ectopic pregnancy. Ectopic pregnancy occurs most commonly in which part of uterine tube?

A. Fimbriae

B. Ampulla

C. Cervix

D. Isthmus

E. Infundibulum



Ectopic pregnancies most commonly occur in ampulla.

10 / 15

First part of duodenum lies at which level of vertebral level?

A. T8

B. L2

C. T6

D. T12

E. LI 💉

First part of the duodenum extends from the pyloric sphincter of the stomach wraps around head of pancreas in C-shaped and ends at duodenojejunal flexure (Recall)

- First part lies at vertebral level L1.
- 2nd part L2-L3
- 3rd part longest section crossing inferior vena cava and Aorta at level L3
- 4th part: pass upward on left of abdominal Aorta at L2



11 / 15

A 21-year-old male patient brought into the ED after road traffic collision. After initial assessment and imaging showed damage to the L1 nerve root. Which of the following muscles are most likely affected?

- A. Rectus abdominis and transverse abdominis
- B. Gluteus maximus and gluteus minimus
- C. Internal and external oblique
- D. Internal oblique and transversus abdominis



E. External oblique and transversus abdominis

Nerve	Spinal Segment	Motor Function	Sensory Function
lliohypogastric nerve	L1	Internal oblique and Transversus abdominis	Skin in pubic region and posterolateral aspect of gluteal region
Ilioinguinal nerve	L1	Internal oblique and Transversus abdominis	Skin in upper medial thigh, skin of base of penis, anterior scrotum mons pubis, and labium majus



12 / 15

A 30-year-old diabetic patient presented to the emergency department with a two-day history of pain in her right eye worsened with eye movement. The diagnosis of optic neuritis was made by ophthalmologist. What will be the cause of optic neuritis?

- A. Retinitis
- B. Retinal detachment
- C. Hyperglycemia
- D. Demyelination

E. Neuromyelitis

Optic Neuritis is an acute inflammatory demyelinating disorder of optic nerve. The myelin undergoes destruction causing axons to poorly conduct impulses

13 / 15

A 3O years old male with history of trauma came into the ED with abdominal pain. Contact us Which of the following vessels are compromised in rectus sheath hematoma?



A. Gastroepiploic vessels

B. Inferior mesenteric

C. Superior mesenteric

D. Celiac artery

E. Inferior epigastric vessel



Rectus sheath encloses rectus abdominis, pyramidalis muscle (RECALL), inferior and superior epigastric vessels, and termination of intercostal nerves T7-T11.

14 / 15

You are teaching group of medical students' lymphatic system and lymph nodes of the body. You ask medical students lymphatics of glans penis drain primarily to which of the following lymph nodes?

A. Superficial inguinal nodes

B. Paraaortic lymph nodes

C. Deep inguinal node

D. Internal iliac nodes

E. External iliac nodes

- Lymphatics from glans penis and penile urethra drain primarily into the deep inguinal nodes
- Lymphatics from penile skin and prepuce drain into superficial inguinal nodes (RECALL)

15 / 15

A 70-year-old male is scheduled to undergo repair of an inguinal hernia that is easily reduced by pushing the abdominal contents back through the external ring. Direct inguinal hernia is due to weakness in which of the following layer?

A. lacunar ligament

B. Transversalis fascia



C. Transversus abdominis

D. External oblique aponeurosis

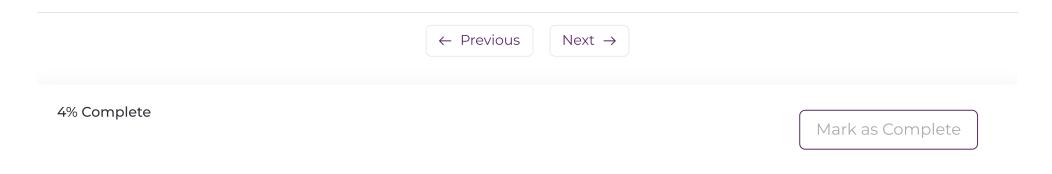
E. Deep inguinal ring

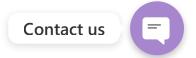
Direct inguinal hernia is common in elderly bulge through weakened fascia of abdominal wall (Transversalis fascia)) directly behind



superficial inguinal ring and medial to the inferior epigastric vessels (Recall)

Indirect inguinal hernia enters inguinal canal at the deep inguinal ring and lateral to inferior epigastric vessels





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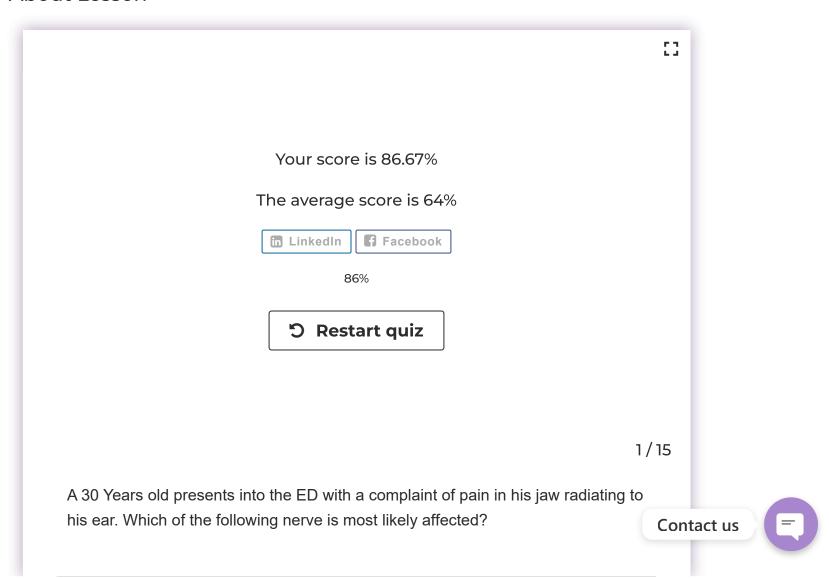
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A. Buccal Nerve
B. Supratrochlear nerve
C. Auriculotemporal Nerve
D. Facial nerve
E. Inferior alveolar nerve

Branches of mandibular nerve	Innervations
☐ Buccal nerve	Sensory: Skin and mucosa over cheek (RECALL)
☐ Auriculotemporal Nerve	Sensory fibers innervate Anterior part of the auricle Lateral part of the temple Anterior external meatus Anterior tympanic membrane The parasympathetic root carries postganglionic fibers to the parotid gland.
☐ Inferior Alveolar Nerve	 Sensory: lower teeth and gingiva, skin of lower lip and chin Motor: Mylohyoid and anterior belly of digastric
☐ Lingual Nerve	 Sensory: Anterior two-thirds of tongue, floor of oral cavity

Note: Skin of ear lobule is innervated by greater auricular nerve (Sensory branch from cervical plexus) RECALL



A 26-Year-old girl presents to the ED with trauma to the internal auditory meatus. Which of the following nerves are most likely injured:

- A. Vestibulocochlear nerve and accessory nerve
- B. Facial nerve and abducens nerve
- C. Trochlear nerve and abducens nerve
- D. Vestibulocochlear nerve and facial nerve



E. Facial nerve and glossopharyngeal nerve

The internal auditory meatus also referred to as the internal acoustic meatus lies in the temporal bone and exists between the inner ear and posterior cranial fossa. It includes the vestibulocochlear nerve (CN VIII), facial nerve (CN VIII), the labyrinthine artery, and the vestibular ganglion.

3 / 15

A 40 years old male presents into the ED with a complaint of being unable to move his jaw. You ask your junior colleague to test the jaw reflex. If jaw reflex is lost which of the following nerve is most likely injured?



A. Glossopharyngeal nerve

B. Facial nerve

C. Vagus nerve

D. Opthalmic division of trigeminal nerve

E. Mandibular division of trigeminal nerve



Reflexes	Pathways
Pupillary light reflex	Afferent: optic nerve Efferent: oculomotor nerve
Corneal reflex	Afferent: Opthalmic division of trigeminal nerve Efferent: Facial nerve(RECALL)
Jaw reflex	Mandibular division of trigeminal nerve
Gag reflex	Afferent: Glossopharyngeal nerve Efferent: Vagus nerve



A 29 years old male presents to the ED with complaint of foot drop and loss of sensation on the dorsum of the foot. Which of the following nerve is most likely damaged?

- A. Tibial nerve
- B. Posterior tibial nerve
- C. Common peroneal nerve
- D. Sural nerve
- E. Sciatic nerve

Common fibular nerve wraps around the neck of fibula and enter lateral compartment of leg where it gives rise terminal branches:

Superficial fibular nerve: Runs around lateral compartment of leg and skin over lower anterolateral leg, and dorsum of foot (except skin over webspace of 1st and 2nd toe)

Deep fibular nerve: Anterior compartment of leg and skin over webspace between 1st and 2nd toes (RECALL)

Note: Common fib5th metatarsalular nerve is vulnerable to damage in the neck of fibula (RECALL)



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Muscles of lateral compartment of leg:

Muscle	Distal attachment
 Fibularis longus	1st metatarsal and medial cuneiform (RECALL)
Fibularis brevis	5th metatarsal

5/15

You are going to attempt lumbar puncture in a patient with suspected meningitis. What is the recommended vertebral level to perform LP?



B. L1/L2

C. T12/L1

D. T11/T12

E. L4/L5 🗸

A lumbar puncture (LP) is a procedure in which a needle is inserted into the spinal canal. It is most commonly used to collect a sample of cerebrospinal fluid (CSF) for diagnostic testing (e.g., for suspected meningitis and subarachnoid hemorrhage)



Lumbar puncture is preferentially performed at L3/L4 or L4/L5 (cauda equina level), to avoid the spinal cord which ends at L1/L2.

The layers penetrated by the spinal needle in an LP are as follows:

- Skin
- subcutaneous tissue
- supraspinous ligament (RECALL)
- Interspinous ligament
- ligamentum flavum
- Epidural space or extradural
- dura mater
- arachnoid mater
- subarachnoid space (contains CSF)

6/15

You are going to attempt carotid sinus massage in a patient with SVT. You ask your colleague at which of the following level you should apply pressure?

A. Thyroid cartilage 🕡



B. Thyrohyoid membrane

C. Cricoid cartilage

D. Hyoid bone

E. Temporomandibular joint

The carotid sinus is the reflex area of the carotid artery consisting of baroreceptors which monitor blood pressure. The carotid sinus is located at the bifurcation of the common carotid artery, which is found at the level of the **thyroid cartilage** and medial to the sternocleidomastoid muscle

7/15

70 years old male presents to the ED with complain of expressive Broca's dysphasia. The brocas speech area is located in which of the following regions?

A. Frontal lobe



C. Occipital lobe

D. Midbrain

E. Temporal lobe

- Broca's speech area is located in frontal lobe
- Broca's aphasia or expressive aphasia is when people find it very difficult to find and say the right words. People with Broca's aphasia may only be able to say single words or very short sentences, although it's usually possible for other people to understand what they mean



- Wernicke's aphasia (fluent aphasia) in the temporal lobe.
- Wernicke's aphasia or receptive aphasia is when someone is able to speak well and use long sentences, but what they say does not make any sense.

A 35 Years old male with a history of RTA was brought into the ED with injury on occipital region. On examination, patient has bitemporal hemianopia. Which structure Is most likely damaged?

A. Optic chiasm



B. Optic radiation

C. Visual area

D. Optic tract

E. Lateral geniculate body

- Contralateral Homonyms hemianopia = optic tract (Recall)
- Bitemporal hemianopia = optic chiasma
- Parietal upper optic radiation: Contralateral homonymous inferior quadrantanopia



• Temporal lower optic radiation: Contralateral homonymous superior quadrantanopia (Recall)

• Occipital visual cortex: Contralateral homonymous hemianopia with macular sparing e.g.: Lesion of right temporal lobe would result in left homonymous superior quadrantanopia causing left temporal and right nasal vision loss (Recall)

9 / 15

A 30 years old male was brought into the ED following a fall from a height. His examination reveals bilateral weakness in both arm power of 3/5 and his lower limb power is 4/5, he also has variable sensory impairment

What is the most likely diagnosis?

A. Anterior Cord Syndrome

B. Posterior Cord Syndrome

C. Central Cord Syndrome



D. Brown Sequard Syndrome

E. Complete Cord Transection

-Spinal cord injuries spinal tracts and their normal function



Dorsal column	Located: posteromedial aspect of spinal cord	Transmit ipsilateral proprioception, vibration and light touch sensation
Spinothalamic tract	Anterolateral aspect of cord	Transmit contralateral pain, crude touch and temperature sensation
Lateral corticospinal tract	Posterolateral aspect of cord	Control ipsilateral motor power

Spinal cord syndrome

Card syndrome	Mechanism	Tract injury	Symptoms
Complete cord transection	Major trauma	All tracts	 Death if c1-c3 injured. Quadriplegia Paraplegia Complete sensory loss below lesion Urinary and faecal continence
Brown- Séquard syndrome	Hemitransection or unilateral compression of the cord	All tract on one side	 Ipsilateral hemiparesis Ipsilateral loss of proprioception, vibration and fine touch sensation Contralateral loss of crude touch, pain and temperature sensation
Central cord syndrome	usually seen in older patients with preexisting cervical spondylosis who sustain a hyperextension injury	Corticospinal tract and spinothalamic tract	Bilateral motor loss Varying degree of sensory loss Greater loss in upper limb than lower limb Greater loss of motor in upper limb than sensory function

Anterior cord syndrome (Recall)

Anterior cord syndrome	Direct anterior cord compression Flexion of cervical spine Thrombosis of anterior spinal artery	Corticospinal, spinothalamic and spinocerebellar tracts	 Bilateral motor loss Bilateral loss of crude touch, pain and temperature sensation
Posterior cord syndrome	hyperextension injury associated with vertebral arch fractures or penetrating trauma to the back	Dorsal column	 Bilateral loss of proprioception, vibration and light touch sensation

A 25 years old male presents to the ED with a complaint of progressive difficulty in walking. When you observe him, he walks with waddling gait and pelvis falling towards the left side on each step. Which of the following nerve is most likely injured?

A. Inferior gluteal nerve



B. Ilioinguinal nerve

C. Superior gluteal nerve



D. Sciatic nerve

E. Obturator nerve

Trendelenburg gait or waddling gait occurs when your hip abductor muscles are weakened. This muscle group includes the gluteus medius



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> and minimus innervated by superior gluteal nerve. The weakness of these muscles causes drooping of the pelvis to the contralateral side while walking (RECALL)

> > 11 / 15

A 52 years old chronic smoker presented to the ED with complaint of sudden severe headache. After initial assessment and imaging revealed a ruptured berry aneurysm. Which of the following blood vessel is most likely location of the aneurysm?

- A. Anterior cerebellar artery
- B. Internal carotid artery
- C. Middle cerebral artery
- D. Posterior cerebellar artery
- E. Anterior communicating artery



Berry (saccular) aneurysms are the most common type of intracranial aneurysm, representing 90% of cerebral aneurysms. The most frequent location is the anterior communicating artery (35%), followed by the internal carotid artery

Contact us



High Yield: Clinical effects of occlusion of cerebral arteries

Blood vessel	Clinical effects of occlusion of cerebral arteries
Anterior cerebellar artery	FRONTAL LOBE: contralateral weakness in lower limb, dysarthria, dysphasia, apraxia and urinary incontinence. PARIETAL LOBE: contralateral somatosensory loss in the lower limb
Posterior cerebellar artery	OCCIPITAL LOBE: contralateral homonymous hemianopia with macular sparing, cortical blindness (if bilateral). TEMPORAL LOBE: memory deficit OCCIPITOTEMPORAL REGION: prosopagnosia, and color blindness
Middle cerebellar artery	FRONTAL LOBE: contralateral weakness (face/arm greater than leg), conjugate deviation of the eyes to affected side, expressive dysphasia. TEMPORAL LOBE: deafness (if bilateral), receptive dysphasia, auditory illusions and hallucinations, contralateral superior quadrantanopia. PARIETAL LOBE: loss of sensory discrimination, hemineglect, apraxia, contralateral inferior quadrantanopia (RECALL)

Which one of the following muscles are flexor of thigh at hip joint and flexor of leg at knee joint?

A. Pectineus



B. Rectus femoris

C. Iliacus

D. Psoas major

E. Sartorius



All the muscles of anterior compartment of thigh are flexors of thigh at hip joint while Quadriceps femoris (Rectus femoris, Vastus lateralis, Vastus medialis and Vastus intermedius) is extensor of leg at knee joint. Some exceptions are:

- Sartorius is also flexor of leg at knee joint and lateral rotator and abductor at hip joint
- Rectus femoris is also flexor of thigh at hip joint (RECALL)
- Lateral rotators of hip: Anterior C.O.Thigh muscles include Sartorius, iliacus and psoas major
- Lateral rotators of hip: Muscles of the hip region include Piriformis (RECALL), obturator internus and externus, gamellus superior and inferior and quadratus lumborum

Note: All the muscles of anterior compartment of thigh are innervated by femoral nerve **except psoas major that is through lumbar plexus** (**RECALL**)



A 50-year-old male known case of hypertension presents to the ED with complaint of vertigo, ataxia, ptosis, and miosis. Which of the following blood vessel is most likely occluded?

- A. Superior cerebral artery
- B. Middle cerebral artery
- C. Pontine artery
- D. Posterior inferior cerebral artery



E. Anterior inferior cerebral artery

Posterior inferior cerebellar artery occlusion result in type of stroke called Lateral medullary syndrome or Wallenberg's syndrome characterized by variety of symptoms which include:

- Vertigo, vomiting, nystagmus
- Crossed sensory disturbance
- Ipsilateral Horner sign
- Dysphagia, dysarthria
- Ipsilateral ataxia

Occlusion of AICA is considered rare, but generally results in a lateral pontine syndrome, also known as AICA syndrome



A 20 years old young boy after assault in the college presents to the ED with superficial lacerated wound on his anterior triangle of neck. Which of the following muscle is most likely injured?

- A. Scalene muscle
- B. Sternocleidomastoid
- C. Trapezius muscle
- D. Platysma
- E. Suprahyoid

Neck fascia is divided into superficial and deep fascia

- Superficial fascia includes: Superficial veins (External jugular),
 superficial lymph nodes, fat and platysma muscle
- Deep fascia includes: Trapezius, sternocleidomastoid, Visceras of neck and vasculature includes common carotid artery, internal jugular vein and vagus nerve in the carotid sheath.

15 / 15

A 45 Years old male suffered penetrating trauma to the parotid gland with facial nerve injury. Orbicularis oculi muscle is affected and frontalis muscle is spared.



Which of the following terminal branch of the facial nerve is most likely injured?

A. Greater petrosal nerve

B. Zygomatic branch

C. Buccal branch

D. Temporal branch

E. Marginal mandibular branch

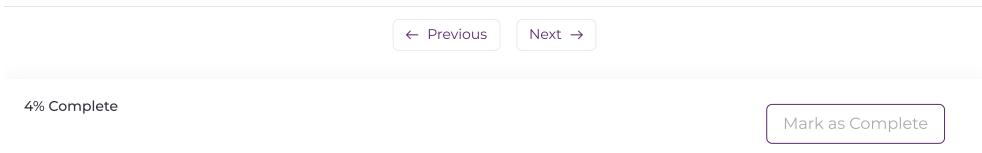
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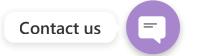
Facial nerve branches in temporal bone	Facial nerve terminal branches in the parotid gland
Chorda tympani: taste from Ant 2/3 of tongue (RECALL) While Ant 2/3 of general sensation of tongue: mandibular division of trigemin nerve	the temple, forehead (Frontalis muscle) and supraorbital areas (upper half of
Greater petrosal nerve: Parasympathetic innervation to lacrimal and mucous glands	Zygomatic branch: innervate muscles in the infraorbital area (Lower half of orbicularis oculi muscle) Recall lateral nasal area and upper lip
	 Buccal branch: muscles in the cheek and upper lip (Recall) Pursing of the lips
	Marginal mandibular branch: innervate muscles of lower lip and chin.

Note: Skin of upper forehead, eye lid and conjunctiva are innervated by supraorbital nerve (RECALL) branch of Opthalmic division of trigeminal nerve

Supratrochlear nerve: Innervate skin of lower central forehead and conjunctiva.







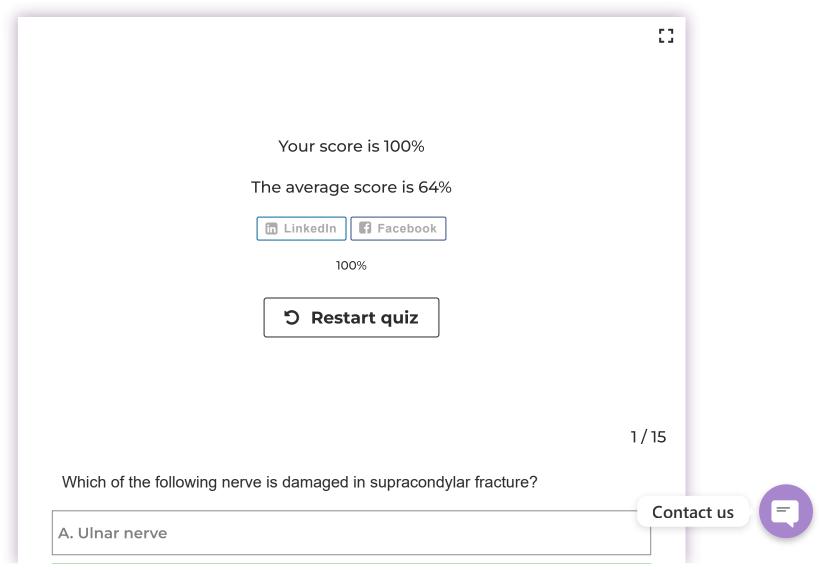
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• 🗐 Overview • 🖃 Comments

About Lesson



B. Median nerve

C. Radial nerve

D. Axillary nerve

Radial nerve injury: Loss of wrist extension (RECALL)	In Axilla: Proximal humerus fracture In spiral groove: Mid shaft humerus fracture (RECALL) In forearm (superficial branch): laceration of forearm In forearm deep branch: Radial head fracture
Median nerve injury	 Proximal median nerve injury at elbow may occur due to supracondylar fracture Loss of flexion of index and middle finger. Loss of flexion, abduction and opposition of thumb (RECALL) due to paralysis of thenar muscles and flexor pollicis longus Flexion of ring and little finger preserved innervated by ulnar nerve. (RECALL) Hand of benediction: Inability to flex at the MCP and IP joints of the middle and index fingers (RECALL)
Ulnar nerve injury	 Froment sign paralysis of adductor pollicis muscle(RECALL) Partial claw hand: ulnar nerve injury below elbow causes flexion of 4th and 5th fingers.
Musculocutaneous nerve injury	Loss of sensation over lateral aspect of forearm (RECALL) Loss of flexion of arm and loss of flexion and supination of forearm (RECALL)

Note: Nerve most likely damaged in antecubital fossa is Median nerve.(RECALL)



You are required to perform resuscitative thoracotomy in a patient with massive hemothorax. Which one of the following muscles are divided during anterolateral thoracotomy?

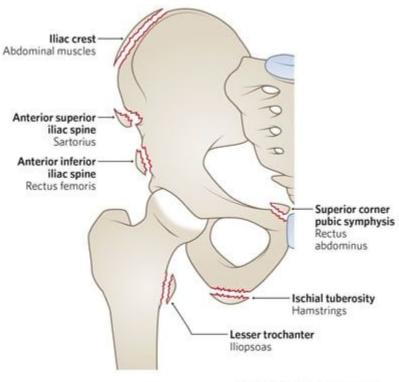
- A. Trapezius
- B. Pectoralis minor
- C. Anterior scalene
- D. Serratus anterior
- E. Latissimus dorsi
- Antero lateral thoracotomy muscle divided serratus anterior and pectoralis major
- Antero lateral thoracotomy: Nerve injury long thoracic nerve (Recall)
- Post: lateral thoracotomy muscle divided latissimus dorsi
- Post: lateral thoracotomy nerve injury: Thoracodorsal nerve injury
- Internal mammary artery (RECALL) and Aorta are likely to be damaged also



You are teaching group of medical students about origin and insertion of muscles. Which of the following muscle originate from the anterior superior iliac spine?

A. Sartorius 🗸
B. Psoas major
C. Rectus femoris
D. Iliacus
E. Pectineus

Origin of most important lower limb muscles



C The Repai Children's Hospital Melbrurne, Australia

Note: Greater trochanter of femur is site of insertion of gluteus Medius, gluteus minims and piriformis (RECALL)

4/15

A 40 years old male presents to the ED with complain of ptosis with left-sided droopy eye and dry left face. You suspect Horner's syndrome. Which of the following nerve is most likely affected?

A. Cervical Sympathetic chain



Contact us



B. Facial nerve

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C. Vagus nerve

D. Infratrochlear nerve

E. Long Ciliary nerve

Sympathetic fibers if unilaterally damaged may produce ipsilateral Horner's syndrome. Horner's syndrome characterized by triad of:

- Ptosis
- Miosis
- Anhidrosis

5 / 15

Whilst in your emergency department your consultant asks you to perform chest examination. Righr middle lobe is best auscultated between which of the following ribs?

A. Rib 2-3

B. Rib 4-6

C. Rib 3-4

D. Rib 2-4

E. Rib 1-2

- The superior lobe of the right lung is best auscultated above the 4th rib anteriorly.
- The middle lobe of the right lung is best auscultated between the 4th and the 6th rib anteriorly.
- The superior lobe of the left lung is best auscultated above the 6th rib anteriorly.
- The inferior lobes of the left and right lungs are best auscultated in the back between T3 & T10.

6/15

Transverse thoracic plane lies at the level of which of the following anatomically relations?

- A. 5th intercostal space
- B. 3rd intercostal space
- C. 4th intercostal space
- D. 2nd intercostal space
- E. 1st intercostal space

Transverse thoracic plane lies at the level of 2nd intercostal space and intervertebral disc between T4 & T5

CLAPTRAP is useful mnemonic to remember structures transected by transverse thoracic plane.

- C: cardiac plexus
- L: ligamentum arteriosum
- A: aortic arch (inner concavity) RECALL
- P: pulmonary trunk bifurcation
- T: tracheal bifurcation (carina) RECALL
- R: right-to-left movement of the thoracic duct (posterior to the esophagus)
- A: azygos vein drains into superior vena cava
- P: pre-vertebral fascia and pre-tracheal fascia end

7 / 15

Whilst in your cardiology rotation you are asked to perform cardiovascular examination. One of your senior registrars asks, what is the best site to auscultate mitral valve?

A. Apex of heart

B. 5th intercostal space to the lower left sternal border

C. Second right intercostal space

D. Second left intercostal space

E. Right 5th ICS in midclavicular line

Areas of auscultation of heart:

Aortic valve Second right intercostal space (RECALL)

Pulmonary valve Second, left intercostal space

Tricuspid valve 5th intercostal space to the lower left sternal

border

Mitral valve Apex, Left 5th ICS in midclavicular line

8/15

You are teaching group of medical students' full neurological examination while assessing dermatomal supply of trunk you ask medical students, what is the dermatome of nipple?

A. T6

B. T4

C. T2

D. T8

E. T3

Dermatomal supply of trunk

T4 Level of nipples

T6 Level of xiphisternum (RECALL)

T10 Level of umbilicus (RECALL)

T12 Midpoint of inguinal ligament

9/15

A 29-year-old woman presents to the Emergency Department after injuring her left elbow. She is complaining of a weak grip on her left hand. You ask her to hold on to a piece of paper with both hands as you try to pull it away from her. The result of this clinical test is shown below.

What nerve is most likely to be damaged?



A. Axillary		
B. Ulnar		
C. Musculocutaneous		
D. Radial		
E. Median		

Froment sign caused by damage to the ulnar nerve and paralysis of adductor pollicis muscle (RECALL)

10 / 15

A 32-year-old male with a history of RTA presented to ED with Complain of pain in his Right shoulder. X-ray was done which shows anterior shoulder dislocation. Which of the following nerve is most likely damaged?

A. Lower subscapular nerve



B. Suprascapular nerve

C. Axillary nerve

D. Median nerve

E. Ulnar nerve

Intrinsic muscles of the shoulder: Connecting the scapula to the humerus

There are six muscles in this group the deltoid, teres major, and the four rotator cuff muscles (supraspinatus, infraspinatus, subscapularis, and teres minor).

Deltoid	Teres major	Supraspinatus	Infraspinatus	Teres minor	Subscapularis
Origin: Lateral third of clavicle, acromion, spine of scapula Insertion Middle of lateral surface of shaft	Origin: Lower third of lateral border of scapula Insertion Medial lip of bicipital groove of humerus	Origin: Supraspinous fossa of scapula Insertion Greater tuberosity of humerus; capsule of shoulder joint	Origin: Infraspinous fossa of scapula Insertion Greater tuberosity of humerus; capsule of shoulder joint	Origin: Upper two-thirds of lateral border of scapula Insertion Greater tuberosity of humerus; capsule of	Origin: Subscapular fossa Insertion Lesser tuberosity of humerus Nerve supply
Nerve supply Axillary nerve (C5-C6)	Nerve supply Lower subscapular nerve (C6 – C7)	Nerve supply Suprescapular nerve (C4, 5, 6)	Nerve supply Suprascapular nerve (C4), 5, 6	Nerve supply Axillary nerve (C4), C5, 6	Upper and lower subscapular C5, 6, 7 Function
Function Abducts arm; anterior fibers flex and medially rotate arm; posterior fibers extend and laterally	Function Medially rotates and adducts arm and stabilizes shoulder	Function Abducts arm to initial 15 degrees and stabilizes shoulder joint	Function Laterally rotates arm and stabilizes shoulder joint.	Function Laterally rotates arm and stabilizes shoulder joint.	Medially rotates arm and stabilizes shoulder joint



Note: Axillary nerve injury also results in weakness of deltoid(RECALL) and teres minor and resulting in weakness of abduction and lateral rotation.

11 / 15

Which of the following best describes the course of the great saphenous vein:

- A. Posterior to medial malleolus
- B. Anterior to medial malleolus
- C. Anterior to lateral malleolus
- D. Posterior to lateral malleolus
- E. Passes behind posterior malleolus
- The great saphenous vein passes anterior to the medial malleolus, travels up the medial side of the leg, and thigh to pass through the saphenous opening in the deep fascia of thigh, and joins with femoral vein.
- Small saphenous vein passes posterior to lateral malleolus

12 / 15

Which one of the following viscera lie immediately posterior to the left atrium?



A. Trachea
B. Subclavian artery
C. Esophagus 🗸
D. Thymus gland

E. Arch of aorta

Esophagus lie immediately posterior to the left atrium.

Dysphagia megalatriensis, also known as cardiovascular dysphagia is an impairment of swallowing due to esophageal compression from a dilated left atrium.

13 / 15

You are teaching group of medical students regarding anatomy of soles of foot. You ask medical student's plantar arteries and nerves lie between the which layer of sole of foot.

A. 2nd and 3th layer

B. 2nd and 4th layer



C. 1st and 2nd layer

D. 4th and 5th layer

E. 3rd and 4th layer

- Tendon of flexor digitorum brevis lie within the ist layer
- Plantar arteries and nerves lie within ist and 2nd layer
- Tendons of flexor hallucis longus and flexor digitorum longus lie within 2nd layer
- Flexor hallucis brevis muscle lies within 3rd layer
- Tendons of tibialis posterior and fibularis longus muscle lie within 4th layer

14 / 15

Which one of the following vessels is compressed in thoracic outlet syndrome?

A. Subclavian artery and vein



B. Brachiocephalic trunk

C. Internal carotid artery

D. Vertebral artery

E. Common carotid artery

Thoracic outlet syndrome (TOS) refers to the clinical features that arise from compression of the neurovascular bundle within the thoracic outlet

- Compression of brachial plexus
- Compression of subclavian artery
- Compression of subclavian vein

15 / 15

A 23-year-old male presents to the ED with a complaint of loss of sensation in the medial half of palm. Regarding ulnar nerve receives its fibers from which of the following nerve roots?

A. C7-C8

B. C7-T1

C. C8-T1

D. C5-C6

E. C6-C7

BRANCHES OF LATERAL CORD "LML"

1.Lateral pectoral nerve



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2. Musculocutaneous nerve

3.Lateral root of median nerve

BRANCHES OF MEDIAL CORD "M4U"

1.Medial pectoral nerve

2.Medial cutaneous nerve of arm

3. Medial cutaneous nerve of forearm

4. Medial root of median nerve

5.Ulnar nerve

BRANCHES OF POSTERIOR CORD "ULTRA"

1.Upper subscapular nerve

2.Lower subscapular nerve

3.Thoracodorsal nerve

4.Radial nerve

5.Axillary nerve

Way to remember root value of upper limb nerves

- C3, C4: Supraclavicular nerve
- C5, C6: Axillary nerve (RECALL)
- C5, C6, C7: Musculocutaneous Nerve and long thoracic nerve
- C6, C7, C8: Thoracodorsal Nerve





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• C5, C6, C7, C8 and T1: Median and Radial Nerve

• C8-T1: Ulnar nerve

← Previous Next →

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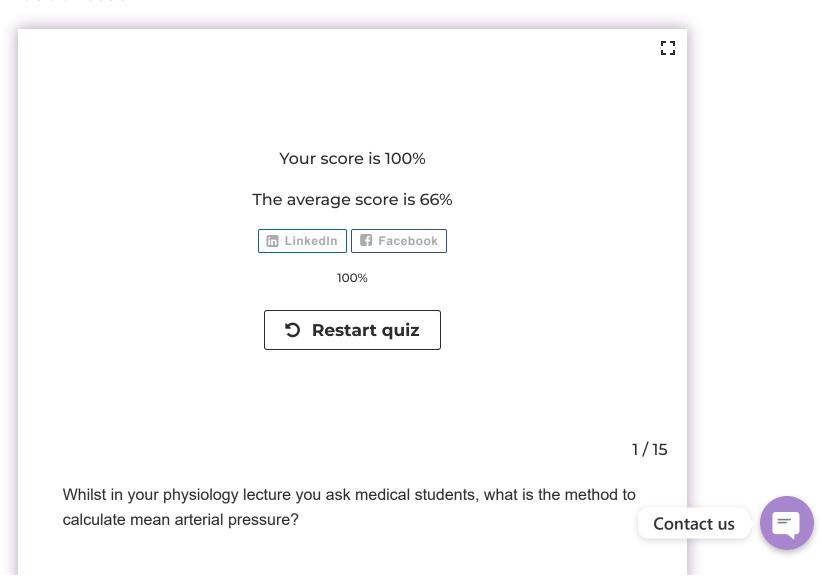
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Overview •

E Comments

About Lesson



A. Diastolic pressure + Systolic pressure

B. Diastolic pressure + pulse pressure

C. Diastolic pressure + 1/3 (pulse pressure)



D. Systolic pressure + 1/3 (pulse pressure)

E. Diastolic pressure + Systolic pressure/2

Pulse pressure is difference between the Systolic and Diastolic pressure e.g., 120-80=40

Mean arterial pressure: Diastolic pressure + 1/3 (pulse pressure) e.g., 80+1/3 (120-80) = 93.2

Cerebral perfusion pressure= MAP- intracranial pressure (RECALL)

2/15

A cardiac patient presents to the Emergency department with an acutely painful, red, hot, swollen big toe. He has past medical history of gout and severe heart failure. Gout is diagnosed. Which of the following is the drug of choice for this patient?



B. Colchicine
C. Paracetamol
D. Prednisolone
E. NSAID

Colchicine mechanism of action: Colchicine has anti-inflammatory properties. It disrupts cytoskeletal functions by inhibiting betatubulin polymerization into microtubules (Recall), preventing activation, degranulation, and migration of neutrophils associated with mediating gout symptoms.

- Colchicine is useful in patients with heart failure and those taking anticoagulants
- Avoid colchicine in patients with blood dyscrasias and bone marrow disease
- NSAIDs are **contraindicated** in a patient with heart failure. (Diclofenac is contraindicated in people with ischemic heart disease).

3 / 15

A 52-year-old man is unwell with crushing central chest pain. An ECG shows significant ST segment changes. Angiography shows occlusion of the circumflex branch of the left coronary artery.

This condition most commonly results in ischemia in which area of the heart?





- A. Anterior part of the right ventricle
- B. Posterior part of the left ventricle
- C. Anterior part of the left ventricle
- D. Inferior part of the right ventricle
- E. Inferior part of the left ventricle

LCA divides into the anterior interventricular branch and the circumflex branch. The **circumflex branch** follows the coronary sulcus to the left border and onto the posterior surface of the heart and supply left atrium and left ventricle

4/15

A 52-year-old male presents to ED complaining of dizziness and discomfort. After initial assessment at triage his heart rate is found to be 40-60 bpm regular rhythm. ECG demonstrates a normal QRS complex with absent P waves. Which part of the conducting system is most likely acting as pacemaker in this patient?

A. Sinoatrial node



C. Atrioventricular node

D. Bundle of His

E. Bundle branches

Conductive Pathway of Heart:

SA node initiates the cardiac muscle (pacemaker) \rightarrow Internodal fibers and AV node (delay impulse from the atria to ventricle) \rightarrow AV bundle branches \rightarrow Purkinje fibers (from apex to ventricles).

- The sinoatrial node (SAN) is the primary pacemaker located in Right atrium. The SAN will normally discharge at a rate of **60-100 bpm**. If the impulse generated in the Sa node is blocked, a group of cells further down the heart will become its pacemaker.
- The atrioventricular node (AVN) is the secondary pacemaker located between right atrium and ventricle near the atrial septum, and will normally discharge at about 40-60 beats per minute
- Purkinje fibers produce spontaneous action potential at rate of 20-40 bpm.

5/15

A 30-year-old woman presents to the ED with weakness and fatigue. On examination, she has yellow tinge skin, jaundice, and mild splenomegaly. CBC shows her Hb 7g/dl. The patient only takes one medication. Which of the following medications is most likely to cause hemolytic anemia?



A. Propranolol	
B. Mefenamic acid	
C. Ibuprofen	
D. Lithium	
E. TCA	
 Among NSAIDs, Mefenamic acid causes hemolytic anemia Co-amoxiclav causes Cholestatic jaundice (RECALL) 	
	6/15
ADH acts primarily at which of the following sites in renal nephron?	
A. Distal convoluted tubule	
B. Thin ascending limb of loop of Henle	
C. Thick ascending limb of loop of Henle	
C. Thick ascending limb of loop of Henle D. Proximal convoluted tubule	

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ADH binds to **V2 receptors (Recall)** and increases the number of aquaporin-2 at the apical plasma membrane of Distal convoluted tubule and collecting duct and increases water permeability allowing greater water reabsorption

Diabetes insipidus

- Central DI: Low ADH (Recall) less water absorbed
- Nephrogenic DI: ADH resistance, Lithium is the most common acquired cause of nephrogenic DI. (Recall)

Biochemical values include high plasma osmolality >295 mOsm/kg, low urine osmolality <300 mOsm/kg (Recall) and hypernatremia > 145

Note:

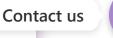
• Syndrome of inappropriate ADH secretion: increased ADH activity (Recall) (Euvolemic hypo osmolar hyponatremia) Recall

Biochemical values include low plasma osmolality < 275 mOsm/kg, increased urine osmolality > 100 mOsm/kg and increased urine sodium or decreased plasma sodium (Recall)

Drugs causing S.I.A.D.H= **S.S.R.I** (Fluoxetine Recall), antipsychotics, anticonvulsants and T.C.A

7 / 15

Which of the following NSAIDs has the least gastrointestinal side effects?



A. Piroxicam
B. Naproxen
C. Ibuprofen
D. Indomethacin
E. Diclofenac

NSAIDS-induced GI side effects:

- Lowest risk=ibuprofen
- Highest risk=piroxicam, ketorolac
- NSAIDs cause GERD by inhibiting the COX 1 enzymes (cox 1 stimulation produce prostaglandins that help to maintain the gastric mucosal integrity) NSAIDs can cause ulcers by interfering with the stomach's ability to protect itself from gastric acid (by inhibiting the function of prostaglandins) RECALL
- NSAID causes hemolytic anemia=Mefenamic acid (RECALL).

8/15

27 years old male presents to the ED with complain of dysphagia. Which of the following nerve is responsible for contracting the esophageal phase of swallowing?

A. Auriculotemporal nerve

B. Hypoglossal nerve

C. Vagus nerve



D. Glossopharyngeal nerve

E. Facial nerve

- Pharyngeal phase of swallowing: glossopharyngeal nerve and vagus nerve
- Esophageal phase of swallowing: Vagus nerve

9/15

Vibrio cholera causes watery diarrhea due to which of following final pathways?

A. Increase proton secretory channels

B. Increased hco3 secretory channels

C. Decreased cl- ion secretion

D. Decrease Camp



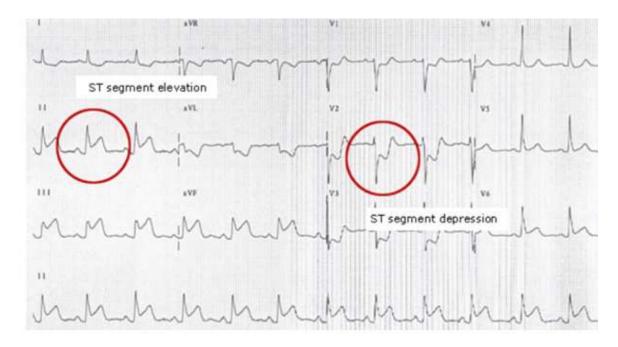
E. Increase cl- ion secretion



Cholera toxin activates adenylate cyclase and increases cyclic adenosine monophosphate (CAMP). CAMP activates the CI-secretory channels and produces a primary secretion of CI- with Na+ and H20.

10 / 15

40 years old male presents to the ED with chest pain and the following ECG is taken. Which artery is most likely be occluded?



A. Left anterior descending

B. left main coronary artery



C. Right coronary artery



D. Left circumflex

E. Obtuse marginal artery

ECG demonstrates Acute Inferior Myocardial Infarction due to occlusion of RCA

• St-elevation in inferior leads (II, III,aVF) with reciprocal ST-depression in I, aVL

Note: Both inferior wall MI and posterior wall MI occurs due to occlusion of Right coronary artery.

11 / 15

You are discussing ECG waveform with group of medical students. You ask ur students, What does the second heart sound correspond to on the ECG waveform:

A. P wave



C. ST segment



E. PR interval		
Heart sound	Mechanical event	Correspondence with ECC
st 1 heart sound	Closure of mitral (Recall) and tricuspid valves	QRS Complex (Recall)
nd 2 heart sound	Closure of aortic and pulmonar valves	T wave
		12 / 15
A 60-year-old male present	s to ED with the complaint of scrotal pain a	
you suspect epididymo-orcl of action of Quinolone?	hitis, and prescribe Quinolone. What is the	THEORIGINSTI
of action of Quinolone?	cell membrane synthesis	

D. Inhibition of bacterial metabolism

E. Inhibition of bacterial protein synthesis

- Quinolone interferes with the bacterial nucleic acid synthesis
- Acyclovir= inhibits bacterial **DNA synthesis (RECALL)**
- Aminoglycosides=inhibit bacterial protein synthesis (bind bacterial 30s subunit) RECALL
- Cephalosporin=bacterial cell wall synthesis inhibitor
- chloramphenicol= inhibit bacterial protein synthesis
- macrolides=inhibit protein synthesis (bind to the bacterial 50s ribosomal subunit)
- Metronidazole= bacterial nucleic acid synthesis inhibitor (RECALL)
- penicillin=inhibit bacterial cell wall synthesis
- Tetracycline= inhibits bacterial protein synthesis (binds to 30S subunit of ribosomes)
- Trimethoprim=inhibit bacterial metabolism.

13 / 15

The probability of rejecting the null hypothesis when it is true;

A. Power of statistical test

B. Type 3 error

C. Type 2 error



D. Level of significance

E. Type 1 error

- In statistical hypothesis testing, a typel error is the mistaken rejection of an actually true null hypothesis (also known as false positive" finding or conclusion; example: innocent person is convicted").
- While type 2 error is the failure to reject the null hypothesis that is actually false (also known as false negative. Finding or conclusion example: guilty person is not convicted) much of statistical theory revolves around the minimization of one or both of these errors, though the complete elimination of either is a statistical impossibility if the outcome is not determined by a known, observable casual process. By selecting low threshold (cut-off) value and modifying the alpha level, the quality of hypothesis test can be increased. The knowledge of type 1 error and type 2 error is widely used in medical science, biometrics and computer science.

14 / 15

which of the following best describes the function of mitochondria is?

A. Protein synthesis

B. Protein packaging

C. Energy production





D. Carbohydrate synthesis

E. Lipid synthesis

• It acts as the site of aerobic respiration and produces cellular energy in the form of ATP (powerHouse of the cell).

15 / 15

A 30 years old male presents to the ED with lacerated wound on his posterolateral back. Which of the following muscle is most likely affected?

A. Levator Scapulae

B. Trapezius

C. Rhomboid minor

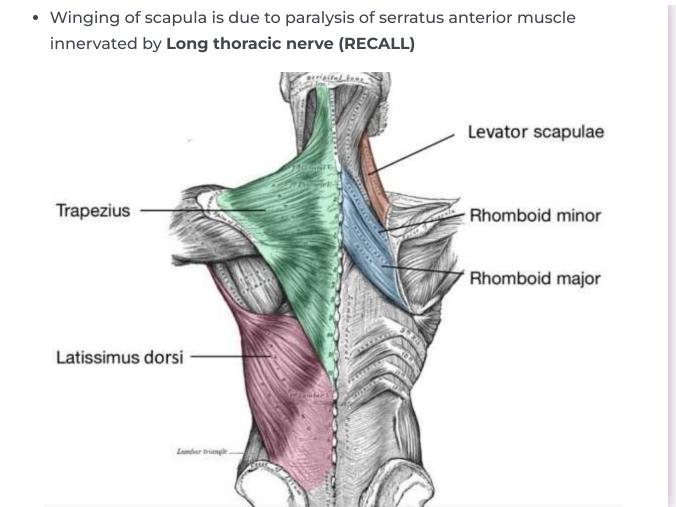
D. Sternocleidomastoid

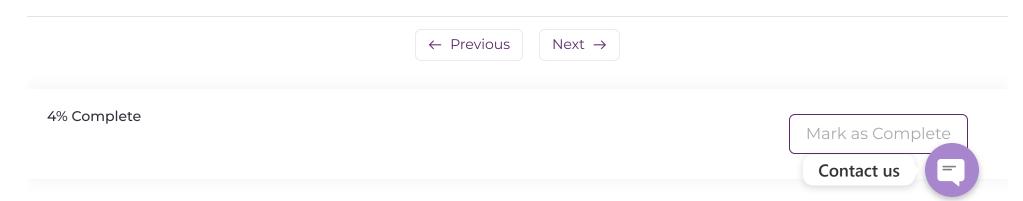
E. Latissimus dorsi



- Latissimus dorsi is the superficial muscle of the posterolateral back innervated by **Thoracodorsal Nerve (RECALL)**
- Ask the patient to shrug his/her shoulder if patient unable to do this indicates spinal accessory nerve injury and paralysis of trapezius muscle (RECALL)







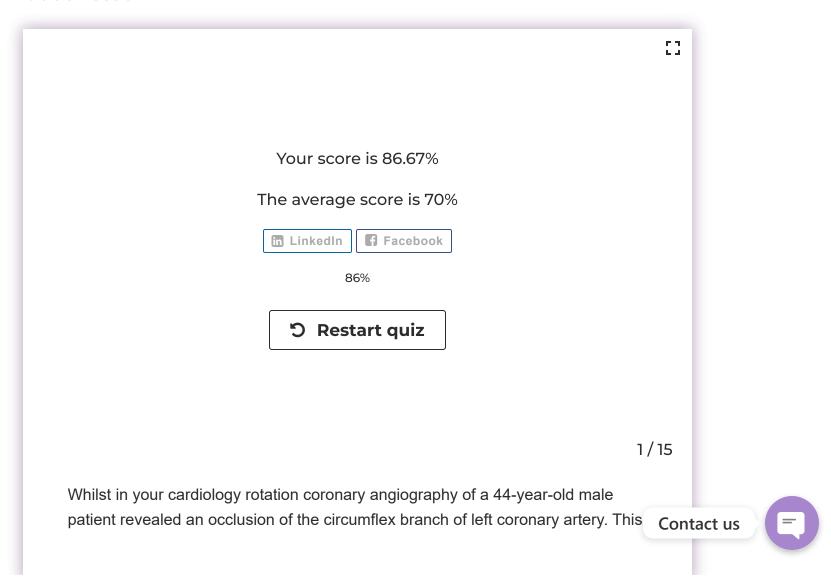
Mrcem Primary Complete Course ,High Yield Stuff and Similar to Previous Exam Questions With Explanation (For Diet 2)



Overview •

Comments

About Lesson



patient has been suffering from myocardial infarction in which of the following area?

- A. Right and left ventricle
- B. Apex of heart
- C. Right and left atria
- D. Left atrium and ventricle



E. Interventricular septum

<u>Left coronary artery gives rise to two branches</u>

- The anterior interventricular branch: supply the right and left ventricle, the apex and anterior two third of interventricular septum.
- Left circumflex branch: supplying the left atrium and left ventricle

The right coronary artery supplies:

- the right atrium and most of right ventricle
- the sinoatrial and atrioventricular node

2/15

A 22 years old girl presents to the ED with complaint of **amenorrhea**. Excess of which of the following Harmone caused this condition?



A. FSH	
B. Oxytocin	
C. Prolactin 🗸	
D. TSH	
E. Growth Harmone	
	ss
Hyperprolactinemia causes amenorrhea/oligomenorrhea (Recall), los of libido and erectile dysfunction	3 / 15
of libido and erectile dysfunction	3 / 15
of libido and erectile dysfunction A 20 Years old girl presents to the ED with complaint of headache, Palpitations and diaphoresis. After initial assessment you suspect pheochromocytoma. This	3 / 15
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of libido and erectile dysfunction A 20 Years old girl presents to the ED with complaint of headache, Palpitations and diaphoresis. After initial assessment you suspect pheochromocytoma. This clinical condition occurs due to excess of which of the following hormones? A. ADH	3 / 15

E. ACTH

Pheochromocytoma is catecholamine secreting tumor arises from chromaffin cells of adrenal medulla

• Catecholamines include adrenaline, nor adrenaline and dopamine.

Adrenaline is predominant Harmone in pheochromocytoma

4/15

Which one of the following hormones is released from posterior pituitary?

A. TSH

B. ADH

C. ACTH

D. FSH

E. Prolactin

Two hormones released from the posterior pituitary gland are ADH and Oxytocin



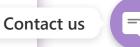
Note: ADH release from posterior pituitary synthesized in hypothalamus. (Recall)

ADH is released in response to raised plasma osmolality seen in dehydration (Recall)

Pituitary Harmone	Inhibited By	Clinical deficiency	Excess
Growth	Somatostatin	dwarfism in	Acromegaly in adults or
Harmone	(Recall)	children	gigantism in children Hyperprolactinemia causes
Prolactin	Dopamine (Recall)	Failure of postpartum lactation	amenorrhea/oligomenorrhea (Recall), loss of libido and erectile dysfunction
ACTH	Cortisol (Recall)	Adrenal insufficiency	Cushing's disease
FSH/LH	Prolactin and oestrogen /testosterone	Infertility	Gonadal insufficiency

5/15

An 87-year-old woman from a residential home with a 2-day history of diarrhea. She has had 10 episodes of watery diarrhea but no vomiting. She complains of colicky lower abdominal pain. She had a 5-day course of antibiotics for a chest



infection 2 weeks ago. After initial assessment diagnosis of clostridium colitis was made. Which of the following is the best way to prevent spread by C.difficle to others?

- A. Wash hand with sterile water
- B. Wash hand with soap and water 🕡



- C. Wash hand with alcohol gel
- D. Antibiotic treatment
- E. Wash hand with sanitizer

Clostridium difficile

Gram +Ve anerobic bacterium transmitted by fecal-oral route

- Alcohol gel is not effective against spores of Clostridium difficile
- Use soap and water



6/15

A 20-week pregnant lady presents to the ED with exposure to chicken pox. What is your next step in management?

- A. No action required
- B. Immediate reinforcing of immunoglobulin
- C. Immediate reinforcing of vaccine
- D. Check her antibody status



E. Attend to antenatal clinic

Key Points:

- If you have already had chickenpox, you have nothing to worry about.
- Once you have had chickenpox you cannot catch it a second time, this is known as being immune.
- Nine out of ten UK adults are immune to chickenpox.
- Chickenpox is very rare in pregnant women in the UK.
- It affects very few babies in the womb and although it can be very serious in pregnancy especially in 1 trimester in first 12 weeks (Recall)
- If you have been in contact with chickenpox and are not sure if you are Contact us immune, contact your GP or midwife and not to attend the antenatal



clinic.

• If you have chickenpox, avoid contact with other pregnant women and new babies until at least five days after the rash appears, or until all the blisters have crusted over.

7 / 15

A 62-year-old patient with pericardial effusion comes to a local hospital for aspiration of pericardial fluid by pericardiocentesis. The needle is inserted into the pericardial cavity through which of the following intercostal spaces adjacent to the sternum?

- A. Right sixth intercostal space
- B. Right fourth intercostal space
- C. Right fifth intercostal space
- D. Left fifth intercostal space



E. Left fourth intercostal space

- <u>Pericardiocentesis</u> is a procedure performed to remove pericardial fluid from the pericardial sac that surrounds the myocardium
- The needle insertion site is 1-2 cm lateral to the apex beat within the fifth intercostal space. Advance the needle over the superior border of the rib to avoid intercostal nerves and vessels.



- High yield:
- Sites for Abdominal Paracentesis:
- Midline Approach = 2 cm below Umbilicus in midline
- Lateral Approach = 3 to 5 cm Superior and Medial to Anterior Superior Iliac Spine.
- <u>Needle Thoracocentesis</u> in Pneumothorax =2nd Intercostal Space
 <u>Midclavicular line.</u> (RECALL)
- <u>Chest Tube Intubation</u>, Pleural tap = Midaxillary Line 5th Intercostal Space.

8/15

A 45 years old male presents to the ED with history of severe vomiting for the last 4 days.. The patient is irritable, weak, and reporting muscle cramping and weakness. On assessment, the patient is experiencing bradypnea with a respiratory rate of 10. The patient has the following ABGs result: HCO3 36, pH 7.52, PaCO2 48. Which condition below is presenting?

- A. Respiratory alkalosis fully compensated
- B. Metabolic acidosis partially compensated



- C. Metabolic acidosis not compensated
- D. Metabolic alkalosis partially compensated





E. Metabolic alkalosis fully compensated

If the primary acid-base disorder is from a respiratory cause, the kidneys will compensate (renal compensation).

If the primary disorder is from a metabolic cause, the lungs will compensate (respiratory compensation).

- Metabolic acidosis= Respiratory compensation (decrease in PaCO2)
- Metabolic alkalosis= Respiratory compensation (increase in PaCO2)
- Respiratory acidosis= Renal compensation (increase in HCO3-)
- Respiratory alkalosis= Renal compensation (decrease in HCO3-)

9/15

Regarding propranolol use in thyroid crises, which one of the following is true?

A. As short-term symptomatic therapy till effect of Carbimazole develops



B. In patients Carbimazole contraindicated

C. In patients not responding to Carbimazole

D. As long-term therapy after subtotal thyroidectomy

E. To potentiate the effect of radioactive iodine



• Propranolol is used as short-term symptomatic therapy till the effect of Carbimazole develops.

•

10 / 15

At which of the following site maximal absorption of vitamin B12 occur?

A. Jejunum

B. Stomach

C. Terminal ileum

D. Proximal ileum

E. Duodenum

- Maximal water reabsorption occurs in Jejunum (Recall)
- Maximal Iron absorption occurs in duodenum (Recall)
- Maximal calcium absorption occurs in duodenum (Recall)
- Maximal vit B12 absorption occurs in terminal ileum

Note: Sub acute cord syndrome: **Due to vitamin B12 deficiency also known as subacute combined degeneration of spinal cord (Recall) there** is mainly degeneration pf posterior and lateral cord

Drugs causing Vit B12 Deficiency: Ethanol, chloramphenicol, H2 receptor blockers, **PPI (Omeprazole) Recall**



11 / 15

A 7-year-old child is brought into the ED by his mother. His mother states that child had wild berries then he suddenly started to have tachycardia, dry skin and urinary retention. What is the likely cause of this condition?

A. Parasympathetic block



- B. Increased parasympathetic response
- C. Sympathomimetic activity
- D. Hypnotic response of wild berries
- E. Cholinergic response

Atropa belladonna commonly known as deadly nightshade is a perennial herbaceous plant with leaves and berries that are extremely toxic contains atropine and scopolamine both antagonist at muscarinic receptor and block parasympathetic

12 / 15

You are going to perform full cardiovascular examination in a patient with known cardiac disease. Your consultant asks how does the 4 heart is produced?



- A. Caused by rapid flow of blood from the atria into the ventricles during the ventricular filling
- B. Caused by closure of the atrioventricular (mitral and tricuspid) valves
- C. Caused by closure of the semilunar (aortic and pulmonary) valves
- D. Caused by filling of an abnormally stiff ventricle in atrial systole



E. Caused by filling of an abnormally stiff ventricle in atrial diastole



3 rd heart sound	Also known as ventricular gallop caused by rapid flow of blood from the atria into the ventricles during the ventricular filling
4 th heart sound	The fourth heart sound, S4, also known as 'atrial gallop' results from the contraction of the atria pushing blood into a stiff or hypertrophic ventricle, indicating failure of the left ventricle

Note: Dicrotic notch on the arterial waveform represent closure of aortic valve (Recall) used to demarcate the end of systole and the beginning of diastole.

High Yield



J.V.P Waveform	Physiology
a wave	A: atrial: right atrial
	contraction
c wave	C: Contraction:
	Isovolumic
	contraction
x descent	Xpress(fast) rapid
	ventricular ejection
v wave	V: Ventricular
	ejection followed by
	isovolumetric
	relaxation
y descent	Ventricular filling

The isovolumic relaxation phase starts when the aortic valve closes (Recall) and ends when the mitral valve opens. During this phase, the left ventricular pressure drops until it becomes lower than that of the left atrium. This allows opening of the atrioventricular valve and the filling of the ventricle.

13 / 15

Regarding propranolol use in thyroid crises, which one of the following is true?

A. To potentiate the effect of radioactive iodine

B. In patients Carbimazole contraindicated



C. In patients not responding to Carbimazole D. As long-term therapy after subtotal thyroidectomy E. As short-term symptomatic therapy till effect of Carbimazole develops • Propranolol is used as short-term symptomatic therapy till the effect of Carbimazole develops. 14 / 15 You are reviewing a patient with infected arteriovenous fistula and he will undergo hemofiltration tomorrow. Which of the following best describes the Transport of molecules across the membrane that occurs in haemofiltration? A. Active transport B. Ultrafiltration C. Simple diffusion D. Facilitated diffusion Contact us E. Osmosis

- Ultrafiltration refers to the process of movement of fluids through a membrane caused by a pressure gradient
- In dialysis, fluid is removed by ultrafiltration using the dialysis membrane. The pressure on the dialysate side is lower so water moves from the blood (place of higher pressure) to the dialysate (place of lower pressure). This is how the hemodialysis treatment removes fluid.

15 / 15

A 38-year-old woman known case of hyperthyroidism presented with palpitations, sweating, and agitation. On examination, she is hyperpyrexic, hypertensive, and tachycardic. She has not been able to take her medicine. which of the following medication would you prescribe immediately to treat her symptoms?

A. Propranolol 🎺

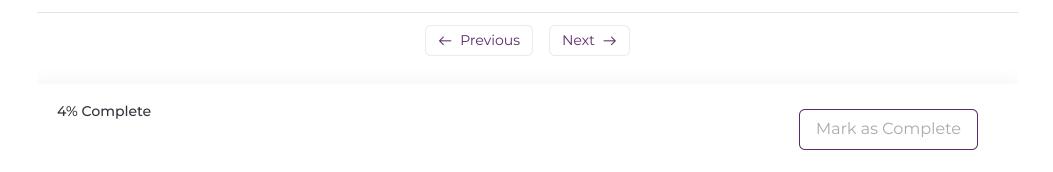
B. Atropine

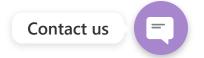
C. Carbimazole

D. lodine solution

E. Hydrocortisone

- Propranolol is the preferred agent in hyperthyroidism and thyroid storm due to its additional effect of blocking the peripheral conversion of inactive T4 to active form T3. They are highly effective for symptomatic relief (tachycardia, tremors)
- In hyperthyroidism (grave's disease) =increased T3, T4 levels, decrease TSH levels (RECALLL)
- In hypothyroidism (Hashimoto's thyroiditis) **=Decrease T3, T4, increase TSH (RECALL)**



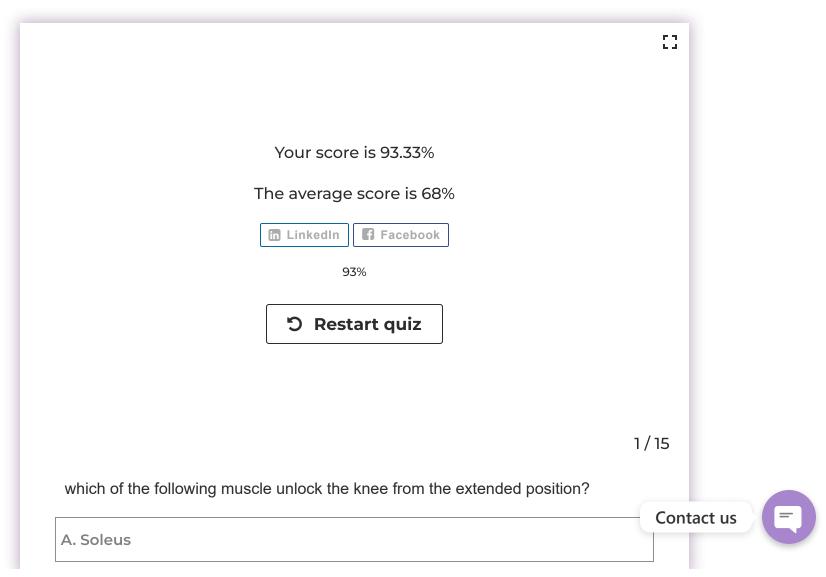


11/5/23, 10:10 AM QUIZ : 7 | MRCEM EXPERT

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About Lesson



B. Plantaris

C. Sartorius

D. Gastrocnemius

E. Popliteus

• At full extension, the tibia and femur "lock" into position, providing stability in the leg and improving load-bearing capacity. The popliteus muscle at the back of the leg unlocks the knee by rotating the femur on the tibia, allowing flexion of the joint.

2/15

Which one of the following hormones helps in the secretion of HCL from the stomach?

A. Cholecystokinin

B. Gastrin

C. Secretin

D. Pepsin

E. Renin



- Gastrin is a hormone that is produced by **G**-cells in the lining of the stomach and upper small intestine.
- Gastrin stimulates the stomach to release gastric acid.

A 24-year-old male presented to ER with a fracture of both the tibia and fibula while playing. The patient demonstrates foot drop. Most common nerve involved in foot drop?

A. Common peroneal nerve



- B. Sciatic nerve
- C. Femoral nerve
- D. Obturator nerve
- E. Tibial nerve

Most commonly, foot drop is caused by an injury to the peroneal nerve (fibular nerve)

- common peroneal/fibular nerve (L4 to S2) supply skin over the lower lateral leg (RECALL) and dorsal aspect of foot and toes (except lateral side of little toe supplied by sural branch of tibial nerve)
- Wrist drop= Radial Nerve (RECALL)
- Claw hand= ulnar nerve (RECALL)



• Ape hand= median nerve

4/15

A 34-year-old male presents to ER with an upper limb injury. He complains of the weakness of flexion of the thumb, index, and middle finger of his right hand. Which of the following nerves is most likely affected?

- A. Posterior interosseous nerve
- B. Posterior interosseous nerve
- C. Palmer Digital branch
- D. Anterior interosseous nerve



E. Deep branch of ulnar nerve

- The anterior interosseous nerve is the terminal motor branch of the median nerve. It branches from the median nerve in the proximal forearm between the two heads of the pronator teres muscle to run deep along the interosseous membrane. From proximal to distal, it innervates the flexor pollicis longus, lateral half of the flexor digitorum profundus, and the pronator quadratus
- Anterior interosseous nerve syndrome is an isolated palsy of these three
 muscles. It manifests mostly as pain in the forearm accompanied
 frequently by a characteristic weakness of the flexion index and thumk
 Contact us
 finger.



 In supracondylar fracture, the Most common nerve injured is the median nerve (RECALL)

5 / 15

Detoxification of lipid drugs and other harmful compounds in ER is carried out by?

A. Cytochrome F

B. Cytochrome P450

C. Cytochrome 360

D. Cytochrome D

E. Cytochrome bf

 Cytochrome P450 enzymes function to metabolize potentially toxic compounds. There are 57 human genes coding for various cytochrome450.

6/15

The conus medullaris of the spinal cord lies at which of the following vertebral level in adults?

A. T11/T12



B. L3/L4

C. T12/L1

D. L4/L5

E. L1/L2 🗸

- Conus medullaris lies at birth= L3 level
- By the age of 21= L1/L2

7/15

The phrenic nerve receive contributions from which of the following?

A. Posterior rami of C3 -C5

B. Posterior rami of C1 -C3

C. Anterior rami of C1 -C3

D. Anterior rami to C4 -C7

E. Anterior rami of C3 – C5

• The phrenic nerve originates from cervical spinal roots C3, C4 and C5



- provide motor innervation to the diaphragm (RECALL).
- provide sensory innervation the central part of the diaphragm, the pericardium and the mediastinal part of the parietal pleura. (RECALL)

The orbicularis Oris muscle perform which of the following function?

A. Closing of the mouth

B. Pursing the lips

C. Blowing of the cheeks

D. Opening of the mouth

E. Closing of eyes

• The orbicularis Oris muscle act to close purse the lips. This muscle also helps in puckering the lips due to which it is sometimes known as the "kissing muscle." The musicians also use this muscle.

9/15

A 55-year-old male presented to ER with Achilles tendon rupture. He has recently started a course of antibiotics from his general physician. Which of the following antibiotics was he most likely prescribed?



A. Tetracycline

B. Doxycycline

C. Penicillin

D. Ciprofloxacin

E. Metronidazole

Side effects of Quinolone (Ciprofloxacin)

- ruptured tendon
- QT prolongation (recall)
- Photosensitivity
- convulsions
- There is increased risk of convulsion when Quinolones are taken with NSAIDS or theophylline.
- There is an increased risk of tendon damage when Quinolones are taken with corticosteroids. (RECALL)
- Ciprofloxacin increases plasma concentration of theophylline(aminophylline). (RECALL)



An 18-year-old boy presents to the ED with a nosebleed. On examination, you suspect the site of bleeding to be in little's area which of the following blood vessels are likely to be involved?

A. Sphenopalatine and superior labial arteries



- B. Descending palatine and ascending pharyngeal arteries
- C. Anterior ethmoidal and posterior superior alveolar arteries
- D. Descending palatine and anterior ethmoidal arteries
- E. Ascending pharyngeal and descending palatine arteries

Little's area also known as Kieselbach's plexus is formed by:

- Superior labial artery
- Sphenopalatine artery
- The greater palatine artery
- The anterior ethmoidal artery

11 / 15

A 40-year-old male presents to ER with a deep laceration to the proximal part of the forearm. On examination when patient is asked to make a fist, he is unable to flex the metacarpophalangeal joints or interphalangeal joints of index and middle





or thumb, ring and little fingers are intact but there is loss of sensation over the lateral palm and the Palmer surface of lateral three and a half fingers. Nerve has most likely been affected is?

A. Radial Nerve

B. Musculocutaneous nerve

C. Ulnar nerve

D. Median nerve



E. Median and radial nerve

- Nerve roots: C6 T1 (also contains fibers from C5 in some individuals).
- Motor functions: Innervates the flexor and pronator muscles in the anterior compartment of the forearm (except the flexor carpi ulnaris and part of the flexor digitorum profundus, innervated by the ulnar nerve (RECALL)). Also supplies innervation to the thenar muscles and lateral two lumbricals in the hand. (RECALL)
- Sensory functions: Gives rise to the palmar cutaneous branch, which innervates the lateral aspect of the palm, and the digital cutaneous branch, which innervates the lateral three and a half fingers on the anterior (palmar) surface of the hand
- In Median nerve injury little finger is spared. (Innervated by ulnar nerve) RECALL
- wasting of thenar eminence: nerve involved= median nerve (RECALL)



 wasting of Hypothenar eminence: nerve involved= ulnar nerve (RECALL)

12 / 15

Sensory innervation of the nasopharynx is supplied by which of the following nerve?

- A. Facial nerve
- B. Mandibular nerve
- C. Glossopharyngeal nerve



D. Maxillary nerve

E. Vagus nerve

Each subdivision of the pharynx has different sensory innervation:

- The nasopharynx is supplied by the maxillary nerve
- The oropharynx is supplied d by the glossopharyngeal (RECALL)
- The laryngopharynx is supplied by the vagus nerve.



13 / 15

A 50-year-old male presents to ER with generalized weakness, on performing neurological examination you noticed that he has unilateral absence of biceps reflex. Which spinal nerves is responsible for this reflex?



A. L1-L2	
B. C5-C6	
C. C8- T1	
D. C6-C7	
E. C7-C8	
 Biceps reflex root value = C5-C Triceps reflex root value= C7-C8 knee = L3-L4(RECALL) Ankle= S1 	
	14 / 15
Which of the following are the phagocytic cells derived from monocytes?	
A. Mast cells	
B. Neutrophils	
C. NK cells	Contact us

D. Macrophages



E. Eosinophils

• Monocytes circulate in the bloodstream for about one to three days and then typically migrate into tissues throughout the body where they differentiate into macrophages and dendritic cells.

15 / 15

A 51-year-old-male patient with myasthenia gravis presents with difficulty swallowing and a cough that has been present for several weeks. A CT scan is performed, which shows the presence of a tumor of the thymus.

Which SINGLE statement regarding the thymus is true?

A. The medulla contains Hassall's corpuscles



B. The cortex is located centrally

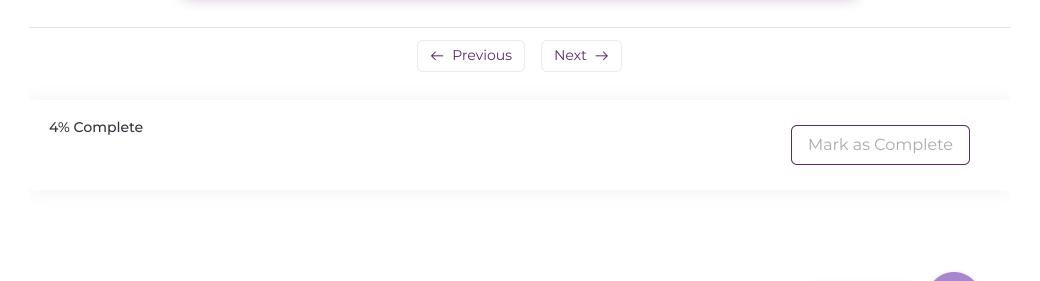
C. It is mainly located within the anterior mediastinum

D. It increases in size after puberty

E. The cortex contains fewer lymphocytes than the medulla



- Is a specialized primary lymphoid organ of the immune system, within which T-lymphocytes mature.
- After puberty, it decreases in size and is slowly replaced by fat.
- It is mainly located within the superior mediastinum, posterior to the manubrium sterni.
- A certain degree of anatomical variation exists, and in some individuals, it can extend superiorly into the neck or inferiorly into the anterior mediastinum.
- The thymus has an asymmetrical, flat shape with a lobular structure.
- The lobules are comprised of a series of follicles, which consist of a medullary and a cortical portion.
- The cortex: Is located peripherally within each follicle and is mainly composed of lymphocytes, supported by a network of finely branched epithelial reticular cells.
- The medulla: Is located centrally within each follicle



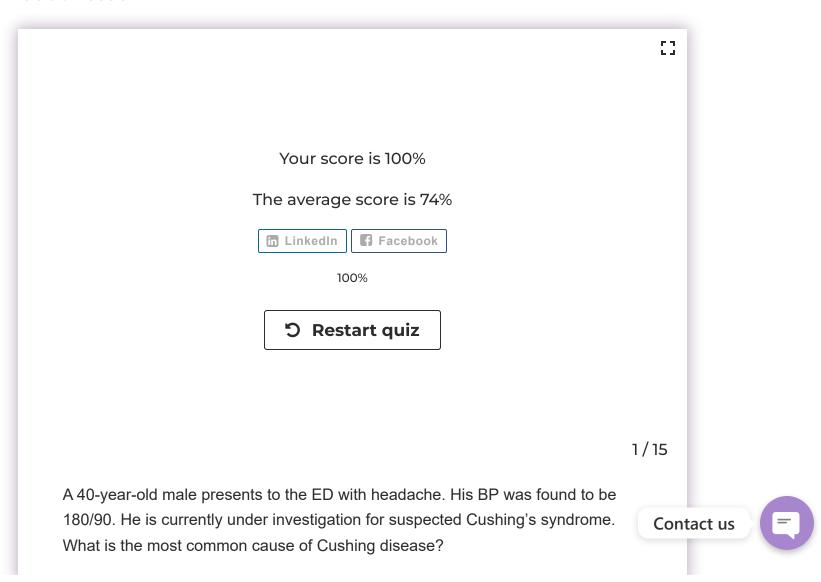
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Overview •

E Comments

About Lesson



A. Pituitary adenoma



B. Adrenal adenoma

C. Adrenal carcinoma

D. Squamous cell lung cancer

E. Small cell lung cancer

Cushing's disease refers to the specific condition of excessive corticosteroids as a result of ACTH secreting pituitary adenoma.

Cushing's syndrome is the name given to clinical symptoms and signs induced by chronic glucocorticoid excess.

Clinical findings:

- Buffalo hump
- Purple striae
- Central Obesity
- Thinning skin that bruises easily
- Acne
- Fatigue
- Muscle weakness
- High blood sugar
- Increased thirst
- Increased urination



•	High	blood	pressure	(hypertension	1)
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What is the vertebral level of bifurcation of the trachea in a living person?

A. T5/T6

B. T6/T7

C. T4/T5

D. T2/T3

E. T3/T4

• The trachea extends from inferior end of larynx at C6 vertebra and ends at the level of sternal angle (T4-T5 Intervertebral disc) where it divides into left and right main bronchi.

3/15

What is the vertebral level of bifurcation of the trachea in a living person?

A. T3/T4

B. T6/T7



C. T5/T6

D. T4/T5 🕜

E. T2/T3

• The trachea extends from inferior end of larynx at C6 vertebra and ends at the level of sternal angle (T4-T5 Intervertebral disc) where it divides into left and right main bronchi.

4/15

A 40-year-old male presents to ER with headache and hypertensive emergency. You prescribe sodium nitroprusside. What is the mechanism of action of sodium nitroprusside?

A. Ca+ channel blocker

B. Alpha adrenoceptor agonist

C. Release nitric oxide

D. Ca+ channel activator

E. Renin inhibitor

- Sodium nitroprusside breaks down in circulation to release nitric oxide (NO).
- Nitrates are potent coronary vasodilators.
- Nitric oxide activates guanylyl cyclase, causing increase in the intracellular concentration of cGMP in vascular smooth muscle cells.
 cGMP activates the protein kinase G, which ultimately cause vascular smooth muscle relaxation (RECALL).

A Patient presents to the ED complaining of jaw pain which radiates towards his ear while eating, which of the following nerve is responsible for this sensation of pain?

A. Zygomaticotemporal nerve

B. Auriculotemporal nerve



C. Supra-Trochlear nerve

D. Zygomaticofacial Nerve

E. Infra trochlear nerve

• The Auriculotemporal nerve branch of mandibular innervates the skin behind the temporomandibular joint and within the superior surface of the parotid gland. It has a course along a temporalis superficialis and



innervates the **tragus (RECALL)** and part of the adjoining auricle of the ear and the posterior part of the temple.

6/15

A patient presents in ER with severe Constipation, his blood Reports show hypocalcemia. Hypocalcemia causes an increase in which of the following hormone?

A. ADH

B. T3, T4

C. Parathyroid

D. Somatostatin

E. Thyroxine

Parathyroid hormone (PTH) levels are mainly controlled by a feedback loop of calcium levels in your blood to your parathyroid glands. In other words, low calcium levels in your blood stimulate parathyroid hormone release, whereas high calcium levels in your blood prevent your glands from releasing parathyroid hormone

Increase in blood po4 concentration also stimulate the PTH hormone release



 Circulating parathyroid hormone targets the distal convoluted tubule and collecting duct, directly increasing calcium reabsorption (RECALL).

7 / 15

Which of the following anesthetic agent cause vitamin B12 deficiency?

A. Thiopental sodium

B. Etomidate

C. Ketamine

D. Propofol

E. Nitrous oxide



 Exposure to nitrous oxide for prolonged periods, can cause vitamin B12 deficiency. Due to interference with the action of vitamin B12, resulting in megaloblastic anemia, neurologic manifestations such as myeloneuropathy and subacute combined degeneration of the spinal cord.

8/15

Whilst performing neurological examination, you ask medical students what is the sensory level of Umbilicus?



A. T9	
B. T11	
C. T10 🗸	
D. T7	
E. T8	

T1= medial antecubital fossa (Recall)

T2= Apex of axilla

T3= third intercostal space

T4= level of nipples (RECALL)

T5= 5th intercostal space

T6= level of xiphisternum (RECALL)

T10= level of Umbilicus

T11= midway between Umbilicus and inguinal ligament

T12= midpoint of inguinal ligament

A 17-year-old girl presents with a maculopapular rash. She has a seven-day history of fever and sore throat and was prescribed an antibiotic 3 days ago.

Which antibiotic is most likely to have been prescribed?

A. Amoxicillin

B. Ciprofloxacin

C. Clarithromycin

D. Cephalexin

E. Phenoxymethylpenicillin



- It is given primarily in streptococcal tonsillitis
- Phenoxymethylpenicillin also known as penicillin v is Used to treat bacterial infections, including ear, chest, throat and skin infection.
- It is also used for prophylaxis against streptococcal infection following rheumatic fever and against pneumococcal infection following splenectomy or sickle cell disease.

10 / 15

An elderly male patient presents to the ED with acute confusion. Lab value reveals Hyponatremia and hyperkalemia, which one of the following hormones is

most likely deficient? A. ADH B. Cortisol C. Aldosterone D. Growth hormone E. Thyroxine Aldosterone deficit results in hyponatremia and hypovolemia, accompanied by hyperkalemia and metabolic acidosis • Aldosterone acts mainly at renal distal convoluted tubule to cause sodium retention and potassium loss (RECALL) · Conn's syndrome (hyperaldosteronism) cause hypernatremia and hypokalemia (RECALL). 11 / 15 A 40-year-old male is brought to the ER having sustained a stab wound to the posterolateral back. Which of the following muscle most likely affected? A. Latissimus dorsi Contact us B. Serratus anterior

C. Anterior scalene muscle

D. Trapezius

E. Rhomboid major

Latissimus dorsi muscle is a broad, flat muscle that occupies the majority of the lower posterior thorax. The muscle's primary function is of the upper extremity but is also considered to be a respiratory accessory muscle

- latissimus dorsi muscle is innervated by thoracodorsal nerve (RECALL)
- latissimus dorsi produces adduction, medial rotation and extension of humerus at glenohumeral joint (RECALL).

12 / 15

A 40-year-old male presents to the ED with headache. His BP was found to be 180/90. He is currently under investigation for suspected Cushing's syndrome. What is the most common cause of Cushing disease?

A. Adrenal carcinoma

B. Small cell lung cancer

C. Squamous cell lung cancer



D. Pituitary adenoma

E. Adrenal adenoma

• Cushing's disease refers to the specific condition of excessive corticosteroids as a result of ACTH-secreting pituitary adenoma.

13 / 15

A 32-year-old male presents to ED with ongoing continuous vomiting. He is several dehydrated. Which of the following hormone released in response to dehydration?

A. Oxytocin

B. Antidiuretic hormone



C. Somatostatin

D. Parathyroid

E. Growth hormone

ADH reduces water loss via lowered urine volume. Extracellular dehydration (hypovolemia) stimulates specific vascular receptors that signal brain centers to initiate drinking and ADH release



- ADH acts on kidney to promote water retention and on the vascular system cause vasoconstriction ADH also known as vasopressin.
 - · ADH and oxytocin are released from posterior pituitary gland (RECALL).

A 38-year-old male brought into the ER having trauma to the face, his frontalis muscle is spared but the orbicularis oculi muscle is affected. Which of the following branch of facial nerve most likely involved?

- A. Cervical Branch
- B. Zygomatic branch
- C. Buccal Branch
- D. Temporal branch
- E. Mental Branch
- Within the parotid gland, the facial nerve terminates by bifurcating into five motor branches. These innervate the muscles of facial expression:
- Temporal: Innervates the frontalis, orbicularis oculi (upper half) and corrugator supercilii.
- Zygomatic: Innervates the orbicularis oculi. (Lower half)



• In this case frontalis muscle is spared which is innervated by temporal branch, so here most likely affected nerve is zygomatic branch (lower half of orbicularis oculi)

QUIZ: 8 | MRCEM EXPERT

- Buccal: Innervates the orbicularis Oris, buccinators and zygomaticus.
- Marginal mandibular: Innervates the depressor labii inferioris, depressor anguli orris and mentalis.
- Cervical: Innervates the platysma (RECALLL).

15 / 15

You have been asked to make a Quick assessment of patient's upper limb neurology as a part of secondary survey. You test each dermatome and note the patient has no sensation at the medial antecubital fossa. The **medial** antecubital fossa tests which of the following dermatomes?

A. C8

B. C7

C. T1 🗸

D. C5

E. C6

DERMATOMES

C2= occipital protuberance (RECALL)





C3= supraclavicular fossa

C4= Acromioclavicular joint (RECALL)

C5 = lateral antecubital fossa

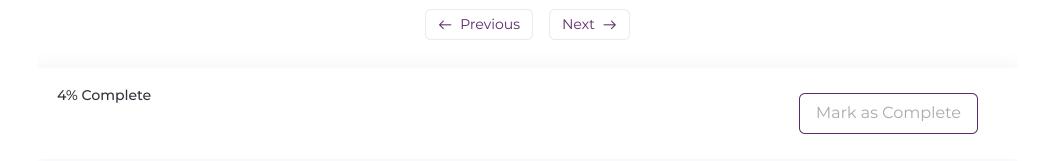
C6= thumb (RECALL)

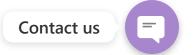
C7=middle finger

C8=little finger

T1= medial antecubital fossa

T2= Apex of axilla





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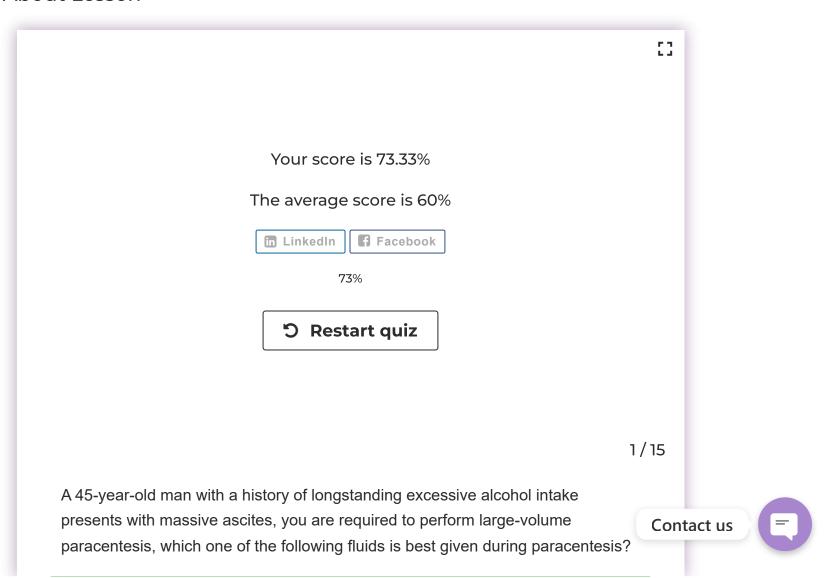
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A. 20% Albumin

B. Half Saline

C. 0.9% N/Saline

D. 10% Albumin

E. Ringer lactate

Administer 1 unit (100ml) HAS 20% (Human Albumin Solution, 20% i.e., 20g albumin per 100ml) (STAT) following every 3 liters of ascites drained.

Note: Paracentesis without albumin replacement leads to a fall in pulmonary capillary wedge pressure, maximal at 6 hours, and can result in circulatory and renal dysfunction.

Note: Ascites results from high pressure in the blood vessels of the liver (portal hypertension Recall) and low levels of a albumin.

2/15

A 30-year-old farmer has sustained a deep laceration to the popliteal fossa and damaged the more medial nerve. Which of the following clinical features you would most likely to see on examination?



- A. Foot drop
- B. Loss of extension of the leg at the knee joint
- C. Weakness of dorsiflexion and eversion
- D. Weakness of plantarflexion and inversion



E. Loss of flexion of the leg at the knee joint

Tibial and common fibular nerve are the most superficial contents of the popliteal fossa. Both are the branches of sciatic nerve

- The common fibular nerve follows the **biceps femoris** tendon, travelling along the **lateral margin of the popliteal**
- Tibial nerve lies more medial

Boundaries and contents of popliteal fossa



Superomedial border	Semimembranosus
Superolateral border	Biceps femoris
Inferomedial border	Medial head of gastrocnemius (Recall)
Inferolateral border	Lateral head of gastrocnemius and plantaris
Floor	The floor of the popliteal fossa is formed by the posterior surface of the knee joint capsule, popliteus muscle and posterior femur.
Roof	The roof is made of up two layers: popliteal fascia and skin. The popliteal fascia is continuous with the deep fascia of the leg.
Contents	Popliteal artery, popliteal vein, tibial nerve, common fibular nerve

A 40-year-old man injured his right wrist during a fall, X-rays demonstrate a lunate dislocation. He is complaining of severe wrist pain and numbness in his hand

Damage to what structure is most likely to be causing these symptoms?

A. Radial artery

B. Median nerve

C. Distal radius

D. Ulnar nerve

E. Scapholunate ligament



 Lunate dislocation occurs by falling on a dorsiflexed wrist. The lunate is forced anteriorly, and compresses the median nerve in carpal tunnel causing the symptoms of carpal tunnel syndrome.

4/15

A 30-year-old male presents to the ED with a 3.5-week history of a cough and hemoptysis. These symptoms began after he was diagnosed with upper respiratory tract infection. He denies having any fever, night sweats, and has not noticed any changes to his weight. Currently, his blood pressure is 155/90 mm Hg, and his pulse is 85 bpm. A physical exam is notable for bilateral crackles and he also has edema on his lower extremities. Lab values reveal a creatinine of 4.5 mg/dL. Urine tests show the presence of proteinuria and also hematuria. A chest X-ray demonstrates the presence of bilateral pulmonary infiltrates. Pulmonary function testing reveals an increased carbon monoxide diffusion capacity (DLCO). What condition might this patient have?

A. PSGN

B. Nephrotic syndrome

C. Lupus nephritis

D. IgA nephropathy

E. Goodpasture syndrome

Contact us



Chief complaints in case of Goodpasture syndrome (GPS):

- Shortness of breath: caused by alveolar hemorrhage.
- Hemoptysis: due to lung involvement
- Hematuria due to kidney involvement

Clinical Workup:

- Presence of pulmonary infiltrates on chest X-ray: caused by pulmonary hemorrhage.
- Increased carbon monoxide diffusion capacity (DLCO) on pulmonary function testing: the present of blood in the alveoli (due to alveolar hemorrhage) results in increased DLCO
- Linear deposition of IgG in the glomeruli (immunofluorescence)

5/15

A 50-year-old woman presents to the ED with generalized weakness and breathlessness. she also gives a history of flu like illness 10 days ago. Her chest X-ray shows cardiomegaly. A diagnosis of myocarditis is made. which of the following pathogen is most likely involved in myocarditis?

- A. Epstein Barr virus
- B. Staphylococcus aureus
- C. Coxsackievirus
- D. Corynebacterium diphtheria

E. Varicella zoster virus



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• Myocarditis is inflammation of the heart muscle (myocardium)

- The most commonly implicated etiology is viral, of which enteroviruses, notably Coxsackie B, are the most common.
- Coxsackie is the most common cause of hand, foot and mouth disease typically spread via respiratory aerosol and feco-oral route (Recall)

6/15

A 30-year-old male presents to ED after being stabbed in the Axilla. On examination you note the loss of sensation over the lateral forearm and you suspect a Musculocutaneous nerve injury. The Musculocutaneous nerve arise from which of the following cord of brachial plexus?

A. Medial and posterior cord

B. Medial cord 💥

C. Posterior cord

D. Lateral cord

E. Lateral posterior cord

• The Musculocutaneous nerve(C5-C7) arise from the lateral cord of brachial plexus



 Motor supply: anterior compartment of arm muscles (coracobrachialis, biceps brachii, brachialis) RECALLL

- SENSORY supply: Lateral forearm (RECALL)
- Function: flexion and supination of forearm (RECALL)

7 / 15

A 30-year-old male patient brought into ED unresponsive after initial assessment you suspect opioid toxicity you started naloxone. Naloxone works on which one of the following receptors?

- A. Gaba receptor
- B. NMDA receptor Antagonist
- C. Opioid mu receptors agonist
- D. Opioid mu receptors antagonist



E. NMDA receptor agonist

Naloxone is opioid mu receptor antagonist rapidly reverse the symptoms of opioid toxicity.

8/15

A 35-year-old male presents with fever and cough productive of small amounts of clear sputum. Chest radiography documents bilateral lower lobe infiltrates that are





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more pronounced on the right side. Causative agent is?

A. Influenza virus

B. Streptococcus pnemoniae



C. Pseudomonas

D. Mycoplasma pneumoniae



E. S. aureus

- Pneumococcal pneumonia is a common lung infection caused by the organism Streptococcus pneumoniae
- Streptococcus pneumoniae is one of the most common causes of community-acquired pneumonia. The clinical presentation of pneumococcal pneumonia includes fever, cough and malaise and may also include chest pain and dyspnea or tachypnoea. Radiographic appearances considered classic for pneumococcal pneumonia include lobar consolidations and air bronchograms in adults and round pneumonia in children

Note: Streptococcus pneumoniae is a commensal pathogen (Recall).

9/15

Regarding the blood supply of the colon, descending colon receives its blood supply from which one of the following arteries?



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B. Gastro-pancreatic artery

C. Superior mesenteric artery

D. Inferior mesenteric artery



E. Gastric artery

As a general rule, midgut-derived structures are supplied by the superior mesenteric artery, and hindgut-derived structures by the inferior mesenteric artery.

- The ascending colon: receives arterial supply from two branches of the superior mesenteric artery; the ileocolic and right colic arteries.
- The transverse colon: is derived from both the midgut and hindgut, and so it is supplied by branches of the superior mesenteric artery and inferior mesenteric artery:

Right colic artery (from the superior mesenteric artery

Middle colic artery (from the superior mesenteric artery)

Left colic artery (from the inferior mesenteric artery)

• The descending colon: is supplied by a single branch of the inferior mesenteric artery; the left colic artery. The sigmoid colon receives



arterial supply via the sigmoid arteries (branches of the inferior mesenteric artery).

10 / 15

A patient presents with life-threatening asthma and requires a salbutamol Infusion. Which electrolyte abnormality is most likely to occur during this administration?

- A. Hyperkalemia
- B. Hypercalcemia
- C. Hypomagnesaemia
- D. Hypokalemia

E. Hyponatremia

Salbutamol Is beta 2 agonist reduces the serum potassium levels by increasing the shift of extracellular potassium into the intracellular space. Salbutamol also used in the treatment of hyperkalemia (RECALL)

Drugs causing hypokalemia:

- B2 agonist (salbutamol)
- Theophylline
- Corticosteroids



- Thiazide
- Furosemide

A 60-year-old woman with a known malignancy on the anterior two thirds of the tongue presents with neck swelling.

What is the most likely group of lymph nodes to be involved first?

A. Preauricular

B. Submental

C. Submandibular

D. Superior clavicular

E. Cervical

Lymphatic Drainage of Oral Cavity

1: The parotid nodes: sit upon the parotid gland and drain it

2: The submandibular nodes: lie on the lateral wall of the submandibular gland and drain the cheek, the upper lip, the lower lip, the maxillary sinus, the upper and lower teeth, the anterior two thirds of the tongue, the floor of the mouth, the vestibule and the gums



• Submandibular nodes drain into deep cervical nodes

• Anterolateral tongue also drain into deep cervical nodes (Recall)

3: <u>The submental nodes</u>: are found in the submental triangle below the chin and drain the tip of the tongue (Recall) and medial part of lower lip

Cervical Nodes

- 1. The superficial cervical nodes: lie on the external jugular vein and drain the skin over the angle of the jaw and the skin covering the lower portion of the parotid gland.
- 2. The deep cervical nodes are as follows:
- 3. **The jugulodigastric node** sits posteroinferiorly to the jaw and **drains the tonsils and the tongue (Recall)**
- 4. **The jugulo omohyoid node:** is found close to the omohyoid muscle and drains the **tongue (post 1/3).**

12 / 15

At journal club you present a paper on the use of a biomarker to predict the presence of clinically important infection.

When assessing applicability to facilitate safe discharge what is the most useful statistical attribute?

A. Sensitivity





C. Negative predictive value



D. Positive predictive value

E. Positive likelihood ratio

• The negative predictive value (NPV) describes the probability of not having the disease. If the test result is negative, the chances of the patient to have the disease is low and can be safely discharge.

13 / 15

A 20-year-old woman underwent arthroscopy on her right ankle because of chronic ankle pain after a sprain. After arthroscopy, the patient complained of pain on the dorsum of her right foot and felt a radiating pain from the anterolateral portal to the dorsomedial aspect of her foot, this was most probably due to injury to which of the following nerve?

A. Saphenous nerve

B. Sural nerve

E. Tibial nerve



C. Superficial fibular nerve



D. Deep fibular nerve



Motor innervation of superficial fibular nerve

- The superficial fibular nerve supplies the fibularis longus and the fibularis brevis. These muscles form the lateral compartment of the lower leg.
- They act to evert the foot (Recall) and thus act at the subtalar joint (eversion is the action of turning the foot outwards).

Sensory Functions

• Superficial peroneal nerve carries sensations from the anterolateral aspect of the leg and the greater part of the dorsum of the foot (except for the first web space).

14 / 15

A 64-year-old man presents to the emergency department with sudden painless loss of vision in his left eye. Which one of the following arteries is most likely occluded?

A. Internal carotid artery



B. External carotid artery

C. Posterior auricular artery

D. Facial artery

E. Vertebral artery



• Central retinal artery occlusion causes sudden painless loss of vision

• Central retinal artery is a branch of ophthalmic artery, and Opthalmic artery is a first major branch of internal carotid artery

15 / 15

A new born baby brought into ED by his mother with complaint of grunting and respiratory distress. You suspect infant respiratory distress syndrome. Regarding surfactant which one of the following is true?

- A. Produced by type 1 pneumocytes
- B. Increase surface tension
- C. Surfactant increases in smokers
- D. Decrease surface tension



E. Decrease lung compliance

surfactant produced by type 2 alveolar epithelial cells pneumocytes (Recall). it decreases surface tension and increases lung compliance

- Surfactant is made-up of 80% of phospholipids (Recall)
- 10% of proteins
- 10% of neutral lipids, mainly cholesterol



Note: Type 1 alveolar epithelium is responsible for gaseous exchange. Impaired gas exchange (Hypoxia) is due to deficiency of Type 1 (Recall)

← Previous Next →

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Mark as Complete

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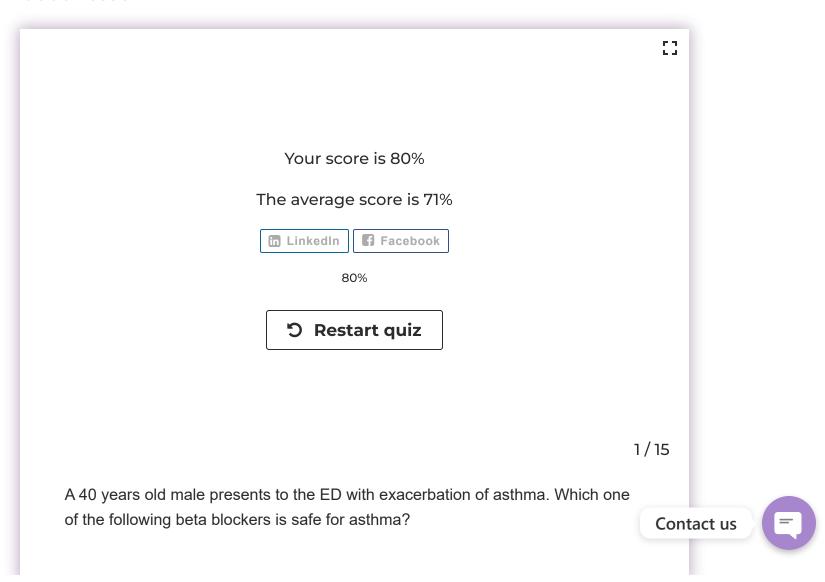
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A. Labetalol	
B. Nadolol	
C. Bisoprolol	
D. Propanol	
E. Carvedilol	
Cardio selective beta blockers like nebivolol, bisoprolol and metoprolo are safe in both asthma and diabetes	I
	2 / 15
Which one of the following organelles has essential role in achieving uterine involution?	
A. Rough endoplasmic reticulum	
B. Smooth endoplasmic reticulum	
C. Mitochondria	
D. Golgi body	Contact us

E. Lysosome

Cell organelle involved in uterine involution is lysosome

While Hormone uterine involution is oxytocin

Note: Mitochondria are responsible for the production of chemical energy in the form of ATP. (Recall)

3/15

Which of the following inhibits acetylcholine-mediated bronchospasm?

A. Naproxen

B. Ipratropium 🎻

C. Theophylline

D. Ephedrine

E. Salmeterol



 Acetylcholine plays an important role in the pathophysiology of asthm via binding to airway muscarinic receptors to trigger



bronchoconstriction, mucus secretion and inflammation.

• Ipratropium acts as an antagonist of the muscarinic acetylcholine receptor inhibit parasympathetic induced bronchoconstriction.

4/15

45 years old male presented to the ED post thyroid surgery with complain of periorbital numbness, paresthesia of hand and feet and abnormal movement what is the cause of his condition?

A. Hypocalcemia



B. Hypokalemia

C. Thyroid Crisis

D. Hypothyroidism

E. Hypomagnesemia

PTH is primarily released in response to decreased calcium. **PTH** causes demineralization of bones and causes increased plasma calcium level (Recall) and decreased phosphate levels

Post-thyroid surgery most likely complication is parathyroid insufficiency leads to hypocalcemia

Note: Parathyroid Harmone increases calcium reabsorption in the distal convoluted tubule of nephron (Recall) and increases excretion



of phosphate by inhibiting reabsorption in the proximal convoluted tubule of nephron

5/15

Which one of the following receptors is mainly responsible for smooth muscle contraction and blood vessels constriction?

Α.	A	lpha	1	/

B. Beta 2

C. Alpha 2

D. Beta 1

E. Beta 3

A useful way to remember: Alpha 1 for constriction, Alpha 2 for inhibition, B 1 for heart, and B2 for relaxation

High yield:



Vasoconstricting Agents	Vasodilating Agents	
Endothelin-1	Nitric oxide (Recall)	
Thromboxane A2	Prostacyclin	
Angiotensin II	Beta-agonists	
Noradrenaline (alpha 1- receptors)		

Note: Nitroprusside is metabolized to nitric oxide, which causes both arterial and venous dilation (Recall) This effect is immediate and results in a decrease in both preload and afterload. (Recall)

6/15

Which of the following type of blood vessels contributes the most of systemic vascular resistance?

A. Arteriole

B. Arteries

C. Capillaries

D. Veins

E. Venules



Resistance is a force that opposes the flow of a fluid. In blood vessels, most of the resistance is due to vessel diameter. As vessel diameter decreases, the resistance increases and blood flow decreases.

- smaller arteries and arterioles contain more muscle and are resistance vessels.
- Veins have large diameter than equivalent arteries and provide less resistance

7 / 15

All of the following drugs causes high anion gap metabolic acidosis except?

A. Aspirin

B. D lactates

C. Methylene glycol

D. Propylene glycol

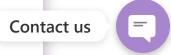


E. Isoniazid

Anion gap can be calculated as (Na + K) -- (Cl + Hco3) Recall. Normal anion gap is 10-16 mmol/L



Normal anion	Causes of a normal anion gap
gap	acidosis: Mnemonic FUSEDCARS
Bab	• Fistula
	(pancreaticoduodenal)
	Ureteroenteric conduit
	Saline administration
	Endocrine
	(hyperparathyroidism)
	Diarrhea (Recall) Carlagain and budges a
	Carbonic anhydrase inhibitors (o. a.)
	inhibitors (e.g.,
	acetazolamide)
	Ammonium chloride
	Renal tubular acidosis
	Spironolactone
High anion gap	Causes of Increased Anion Gap
	Metabolic Acidosis
	Mnemonic MUDPILES
	Methanol
	 Uremia (in renal failure)
	 Diabetic ketoacidosis
	 Propylene glycol overdose
	Infection/Iron
	overdose/Isoniazid
	Lactic acidosis
	 Ethylene glycol overdose
	 Salicylate (Aspirin) overdose
Low anion gap	Hypoalbuminemia (Recall),
	Multiple myeloma



Note: salicylate (Aspirin) overdose initially causes respiratory alkalosis (Recall) followed by metabolic acidosis

8 / 15

A 58-year-old male presents to ED with shortness of breath caused by acute decompensated heart failure with pulmonary congestion. which of the following pulmonary receptor is likely to be involved in causing her dyspnea?

- A. Muscle receptors
- B. Irritant receptors
- C. Chemoreceptors
- D. Juxtrapulmonary (J) receptors



• J-receptors respond to events such as pulmonary edema, pulmonary emboli pneumonia, and barotrauma, which cause a decrease in oxygenation and thus lead to an increase in ventilation/respiration.

J receptors are activated in pulmonary edema in a patient with congestive heart failure and causes reflex **increase in breathing rate** (Recall) also thought to be involve in sensation of dyspnea

Note: Irritant receptors sense chemicals dust and cold air and activation causes coughing (Recall) and bronchoconstriction.



A 10 years old child admitted in hospital and being treated for DKA. In DKA treating complication cerebral edema, hypertonic saline is used. How hypertonic saline will decrease cerebral edema?

- A. K move out of the cell
- B. Water moves out of the cells
- C. Water moves into the cell
- D. There is no net movement of water
- E. Na and k move out of cells

when hypertonic saline is administrated ECF becomes more concentrated compared with ICF. Osmotic potential draw movement of water molecules from inside to out of the cells.

Note: After heavy exercise when person drink water it **increases intracellular fluid ICF volume (Recall)** because water is hypotonic to body fluids dilute extracellular fluid relative to intracellular fluid, osmotic potential draws water into cells.



A 42-year-old man had a long history of heavy smoking, poorly controlled blood pressure (BP), and irregular health checkups. He developed projectile vomiting and then sudden loss of consciousness. He was taken to the emergency room within 30 min. The vital signs showed BP 165/95 mmHg, GCS score of E1M2V1, and bilateral pinpoint pupil, this is most likely a case of?

- A. Metastatic thyroid carcinoma
- B. Pontine hemorrhage
- C. Vertebral artery dissection
- D. Subdural hematoma
- E. Wallenberg syndrome
- Pontine hemorrhage is a form of intracerebral hemorrhage usually result from poorly controlled hypertension, characterized by sudden loss of consciousness, quadriplegia, pinpoint pupil, and respiratory difficulty

11 / 15

A 25-year-old man presents with diabetic ketoacidosis. You start to treat him with short-acting insulin and intravenous fluids as per your local protocol.



Which electrolyte disturbance is the most at risk of developing as a result of your treatment?

- A. Hypophosphatasemia
- B. Hyperchloremia
- C. Hyponatremia
- D. Hypermagnesemia
- E. Hypokalemia 🎻

Insulin excess lowers the serum potassium concentration by driving the K+ into the cells primarily by enhancing the activity of NA-K-ATPase pump.

ECG changes in hypokalemia and hyperkalemia



HYPOKALEMIA	Prominent U wave
	QT prolongation (Recall)
	T wave flattening
	Progressive lengthening
	of PR interval
HYPERKALEMIA	Peaked t waves (Recall)
	Shortened QT interval
	P wave eventually
	disappear
	Broad QRS complex
	(Immediately prior to
	cardiac arrest)

What is the normal right ventricular systolic pressure?

A. 20-30mmhg 🕡

B. 5-10mmhg 💥

C. 3-7mmhg

D. 7-12mmhg

E. 10-20mmhg

 Normal RV systolic pressure is 20–30 mmHg and normal diastolic pressure is 3–7 mmHg.

13 / 15

Regarding the epithelium of respiratory tract. Which of the following is true?

- A. Transitional epithelium
- B. Simple stratified epithelium
- C. Simple squamous epithelium
- D. Stratified columnar epithelium
- E. Ciliated columnar epithelium



Respiratory tract from the trachea down until the respiratory bronchioles is lined with Ciliated columnar epithelium

14 / 15

A 45 years old male presents to the ED with complaint of dizziness and increased pigmentation all over the body. Initial assessment at triage he was hypotensive. Lab value reveals hyponatremia and hyperkalemia. Which one of the following hormone deficiency caused this condition?



A. ADH

B. Cortisol

C. Androgens

D. Aldosterone

E. PTH

Insufficiency of adrenal cortex is called Addison's disease

Deficiency of aldosterone as seen is adrenal Insufficiency result in hyponatremia, hyperkalemia and metabolic acidosis (Recall)

Cushing's Syndrome: Set of symptoms that occur when there is excess of cortisol

Most common cause is exogenous Glucosteroids

Cushing's disease: when Cushing syndrome is caused by ACTH producing pituitary tumor (Most common endogenous cause (Recall)

- ACTH secreting pituitary adenoma
- Excess cortisol due to adrenal adenoma (Recall)



45 years old male presented to the ED post thyroid surgery with complain of periorbital numbness, paresthesia of hand and feet and abnormal movement what is the cause of his condition?

A. ŀ	Нуроса	lcemia
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B. Hypothyroidism

C. Thyroid Crisis

D. Hypomagnesemia

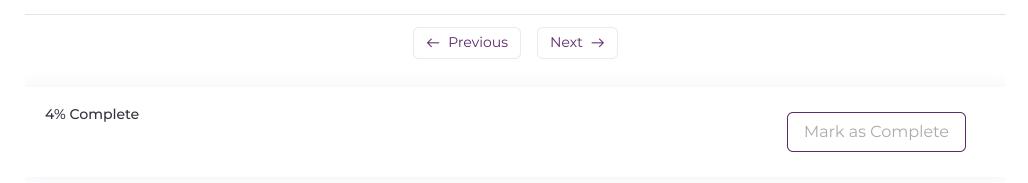
E. Hypokalemia

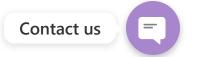
PTH is primarily released in response to decreased calcium. **PTH** causes demineralization of bones and causes increased plasma calcium level (Recall) and decreased phosphate levels

Post-thyroid surgery most likely complication is parathyroid insufficiency leads to hypocalcemia

Note: Parathyroid Harmone increases calcium reabsorption in the distal convoluted tubule of nephron (Recall) and increases excretion of phosphate by inhibiting reabsorption in the proximal convoluted tubule of nephron







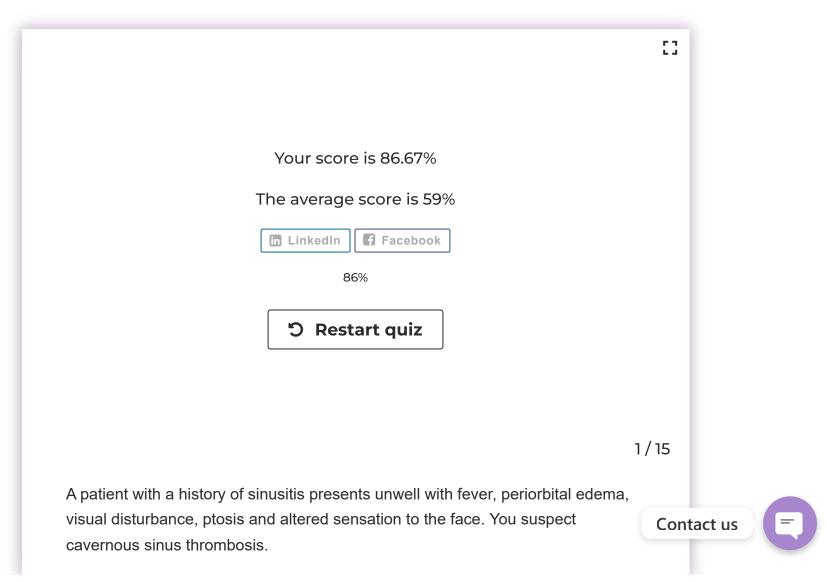
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Overview •

Comments

About Lesson



Which cranial nerve is most commonly affected?

A. Abducent

B. Oculomotor



C. Trochlear

D. Facial

E. Trigeminal

- Cavernous sinus thrombosis (CST) refers to the formation of a clot within the cavernous sinus. It is important to note that the superior ophthalmic vein forms an anastomosis with the **facial vein**. Therefore, the ophthalmic veins represent a potential route by which infection can spread from an extracranial to an intracranial site.
- Note: The abducens nerve (CN VI) is most commonly affected in cavernous sinus thrombosis
- Structures passing through cavernous sinus
- useful mnemonic: O TOM CAT
- OTOM (oculomotor nerve, trochlear nerve, ophthalmic branch, maxillary branch) refers to the lateral wall contents from superior to inferior



• CAT (internal carotid artery, abducens nerve, trochlear nerve) refers to the horizontal contents, from medial to lateral.

2/15

Elderly male presented with c/o high-grade fever with chills rigors and dysphagia. Also had h/o tooth sensitivity, for which consulted dentist and found to have decayed tooth. On examination you bilateral swelling in the floor of mouth. Infection of which space is most common for above presentation?

A. Submandibular space



- B. Retropharyngeal space
- C. Parapharyngeal space
- D. Sub lingual space
- E. Sub mental space

Ludwigs's angina is life threatening cellulitis of the soft tissue of the floor of the mouth and neck.

- Originates from dental infection in the molars specially 2nd and 3rd molars
- involves three compartments of the floor of the mouth, sublingual, submental, and **submandibular (Most commonly).**



A 32-year-old dialysis patient collapses at home. He is due for dialysis today. He has severe hyperkaliemia k+ 7.4, and you perform a 12 lead ECG

What ECG feature would you be most likely to see immediately prior to deterioration to cardiac arrest?

- A. Flattened P waves
- B. Sinus tachycardia
- C. Broad QRS complexes
- D. Prolonged PR interval
- E. Peaked T waves



HYPOKALEMIA	Prominent U wave
	QT prolongation (Recall)
	T wave flattening
	Progressive lengthening
	of PR interval
HYPERKALEMIA	Peaked t waves (Recall)
	Shortened QT interval
	P wave eventually
	disappear
	Broad QRS complex
	(Immediately prior to
	cardiac arrest)

A 70-year-old woman has a pathological fracture of her femur. Her blood tests reveal hypercalcemia, hypophosphatemia, and raised parathyroid hormone.

What is the most likely diagnosis?

A. Osteomalacia

B. Myeloma

C. Primary hyperparathyroidism 🗸



D. Paget's disease



10/26/23, 10:08 PM

E. Bony metastasis

Primary hyperparathyroidism	Calcium increase Decreased phosphate Increased PTH and increased vit D
Secondary hyperparathyroidism	 Decreased or normal calcium Phosphate decreased or increased Increased PTH and decreased vit D
Tertiary hyperparathyroidism	 Increased Calcium Increased phosphate Increased PTH and decreased vit D

Note: In osteomalacia : **Elevated alkaline phosphatase**, **Decreased vit D**, **Hypocalcemia and increased PTH**

5/15

Regarding the pathophysiology of peptic ulcer disease which one of the following statements is true?

A. Gastric inhibitory polypeptide secretion from K cells

B. Bicarbonate secretion from Brunner's glands



C. Bicarbonate secretion from pancreatic ductal cells



D. H+ Secretion from Brunner's glands

E. H+ Secretion from pancreatic ductal cells

Brunner's glands are located in the submucosa of the duodenum. They secrete an alkaline fluid containing mucin, which protects the mucosa from the acidic stomach contents entering the duodenum and provide alkaline condition for the intestinal enzymes to be active

High Yield:

A cell of pancreas =Glucagon

B cells of pancreas -=Insulin

D cells of pancreas =Somatostatin

E cells of pancreas = Ghrelin (Ghrelin released mainly by the stomach and in small amounts released by small intestine and pancreas.

Ghrelin regulates appetite and satiety (Recall)

F cells of pancreas = Pancreatic polypeptide

G cells in pyloric antrum = Gastrin

I cell in duodenum and jejunum = CCK

K cells in duodenum and jejunum = GIP



S cells in duodenum =Secretin

6/15

A 50-year-old woman presents to the ED with palpitations. Her ECG reveals QT prolongation. She has been taking an antibiotic for a skin infection.

Which antibiotic is the most likely to have caused her ECG abnormalities?

- A. Clindamycin
- B. Flucloxacillin
- C. Clarithromycin
- D. Tetracycline
- E. Doxycycline

DRUGS CAUSING QT PROLONGATION

Remember with ABCDEF

ANTI-ARRYTHMICS: amiodarone, procainamide, quinidine, sotalol

ANTIBIOTICS: macrolides, fluoroquinolones

ANTIPSYCHOTICS: chlorpromazine, haloperidol



D ANTI**D**EPRESSANTS: SSRIS (citalopram, escitalopram); TCAS (amitriptyline)

ANTI-EMETICS: domperidone, ondansetron

ANTIFUNGALS: azoles (fluconazole), pentamidine

7/15

A patient with a known spinal cord ependymoma presents to his neurologist for a checkup. He complains that he has had difficulty walking, which he attributes to left leg weakness. On exam, he is noted to have 1/5 strength in his left lower extremity, as well as decreased vibration and position sensation in the left lower extremity and decreased pain and temperature sensation in the right lower extremity. Which of the following spinal cord lesions is most consistent with his presentation?

- A. Syringomyelia
- B. Posterior cord syndrome
- C. Right-sided Brown-Sequard (hemisection)
- D. Anterior cord syndrome
- E. Left-sided Brown-Sequard (hemisection)





Card syndrome	Mechanism	Tract injury	Symptoms
Complete cord transection	Major trauma	All tracts	 Death if c1-c3 injured. Quadriplegia Paraplegia Complete sensory loss below lesion Urinary and faecal continence
Brown- Séquard syndrome	Hemitransection or unilateral compression of the cord	All tract on one side	 Ipsilateral hemiparesis Ipsilateral loss of proprioception, vibration and fine touch sensation Contralateral loss of crude touch, pain and temperature sensation
Central cord syndrome	usually seen in older patients with preexisting cervical spondylosis who sustain a hyperextension injury	Corticospinal tract and spinothalamic tract	Bilateral motor loss Varying degree of sensory loss Greater loss in upper limb than lower limb Greater loss of motor in upper limb than sensory function

A 32 years old male was brought into the ED by paramedics with a complaint of head injury. After initial assessment and imaging results empty Sella turcica. Empty Sella turcica occurs due to fracture of which bone?

A. Sphenoid

B. Temporal

C. Parietal

D. Occipital

E. Frontal



The Sella turcica is a saddle-shape depression in the sphenoid bone of the human skull contains the pituitary gland and distal portion of the pituitary stalk

9/15

Which of the following is the earliest electrocardiogram (EKG) finding in acute myocardial infarction (MI)?

- A. T-wave inversion
- B. Q waves
- C. ST elevation
- D. Hyperacute T waves

E. ST depression



Prominent U wave
QT prolongation (Recall)
T wave flattening
Progressive lengthening of
PR interval
Peaked t waves (Recall)
Shortened QT interval
P wave eventually
disappear
Broad QRS complex
(Immediately prior to
cardiac arrest)
Note: Hyperacute T waves
are the earliest ECG
findings in acute
myocardial infraction.

10 / 15

A 4-year-old African child with sickle cell disease was brought into the ED with a complaint of bone pain associated with a limp. Imaging revealed lucent bone lesion, you suspect osteomyelitis, what is the most likely causative pathogen?

A. Pseudomonas

B. E-Coli



C. Staph epidermidis

D. Staph aureus

E. Salmonella



Salmonella enterica is a gram-negative rod that causes enterocolitis (Food poisoning), Enteric fever (Typhoid), Septicemia, and osteomyelitis

Primarily transmitted through fecal-oral route usually from ingestion of contaminated poultry, eggs, and uncooked meat

High yield:

Regarding osteomyelitis

Most common cause generally: Staph Aureus (Recall)

The most common cause in IV drug abuser: Staph Aureus

The most common cause in sickle cell disease: Salmonella

Most common cause after hip replacement surgery: Staph epidermidis

11 / 15

Whilst in your physiology lecture you ask medical students, which of the following causes a right shift in the oxygen dissociation curve?



A. Increase PH

B. Fetal Hb

C. Decrease PCO2

D. Decrease H+

E. Decrease PH

Causes of left ward shift

Increased affinity for oxygen (Less willing to give up oxygen)

- Increased pH
- Decreased pCO2
- Decreased temperature
- Decreased H+
- Decreased 2-3DPG
- CO poisoning
- Methemoglobinemia
- Fetal hemoglobin (Recall)

Causes of Right ward shift

: Decreased affinity for oxygen (More willing to give up oxygen)



- Decreased pH (Recall)
- Increased pCO2
- Increased H+
- Increased Temperature
- Increased 2-3DPG
- Pregnancy (oxygen to the fetus)

12 / 15

A patient requires intubation due to respiratory failure. Your consultant wants to ensure you correctly preoxygenate the patient to replace nitrogen with oxygen, allowing a safer apnea time during Intubation

Which lung volume measurement best describes the volume of nitrogen that you are displacing?

A. V Vital capacity

B. Functional residual capacity

C. Inspiratory capacity

D. Residual volume

E. Total lung capacity

The functional residual capacity (FRC) is the most important store of oxygen in the body. The greater the FRC, the longer apnoea can be



tolerated before critical hypoxia develops. The aim of preoxygenation is to replace nitrogen in the FRC with oxygen; this process is also referred to as denitrogenation. This has a significant impact on body oxygen store and therefore increases tolerance to apnoea substantially.

13 / 15

A 50 years old male presents to the ED with complaint of shortness of breath. He is known case of restrictive lung disease. In restrictive lung disease which of the following results would you expect to find on spirometry?

A. Low FEV1/FVC ratio

B. Normal FVC

C. Increased FEV1 /FVC ratio



D. Increased FEV1

E. High FVC

In restrictive pattern both FEV1 and FVC reduced but FEV1/FVC ratio increased due to greater elastic recoil



Obstructive lung disease	Restrictive lung disease
asthma, COPD,	Intrinsic causes:
emphysema,	interstitial lung disease
bronchiectasis	(Lung fibrosis) , pulmonary
	oedema, pneumonia
	Extrinsic causes: pleural
	effusion, pneumothorax,
	chest wall deformities,
	neuromuscular disease,
	connective tissue disease
	and obesity
Normal or low FVC	Low FVC
Low FEV1 (Recall)	Low FEV1
Low FEV1/FVC ratio	High FEV1/FVC ratio
(Recall)	
Low vital capacity	Low vital capacity
Residual volume high	Residual volume
Total lung capacity	Total lung capacity low
Normal or high	

14 / 15

Which of the following is not a physiological change in pregnancy?

A. Increased cardiac output



B. Increased plasma volume



C. Decrease in tidal volume



D. Decreased gastric motility

E. Increased red cell volume

Physiological changes in pregnancy

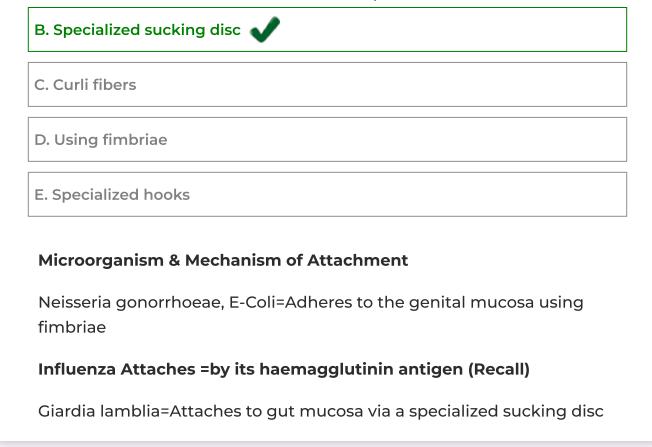
Cardiovascular	Blood	Respiratory	Coagulation
 Increased cardiac output Increased heart rate Decreased peripheral vascular resistance 	Increased plasma volume Increased Red cell volume Anemia	Increased tidal volume (Recall) Decrease residual volume Decreased FRC (Recall)	 Increased factor vii,viii,ix,x,xii, von Willibrand factor and fibrinogen. Decreased protein S

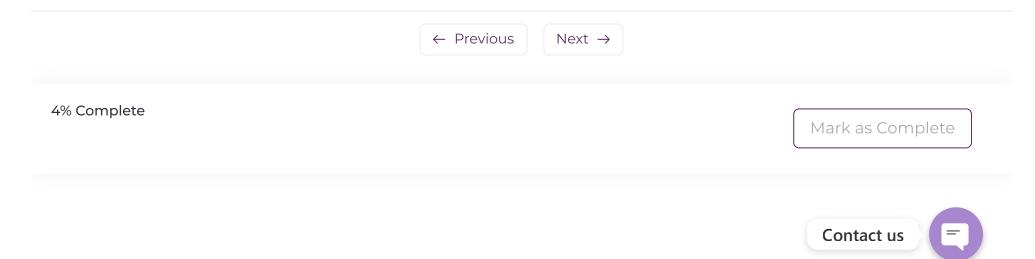
15 / 15

A 30 years old male presents to the ED with complain of abdominal bloating, nausea, and bouts of watery diarrhea. You suspect infection of giardia lamblia. Giardia lamblia attaches to gut mucosa via?

A. Attaches by its haemagglutinin antigen







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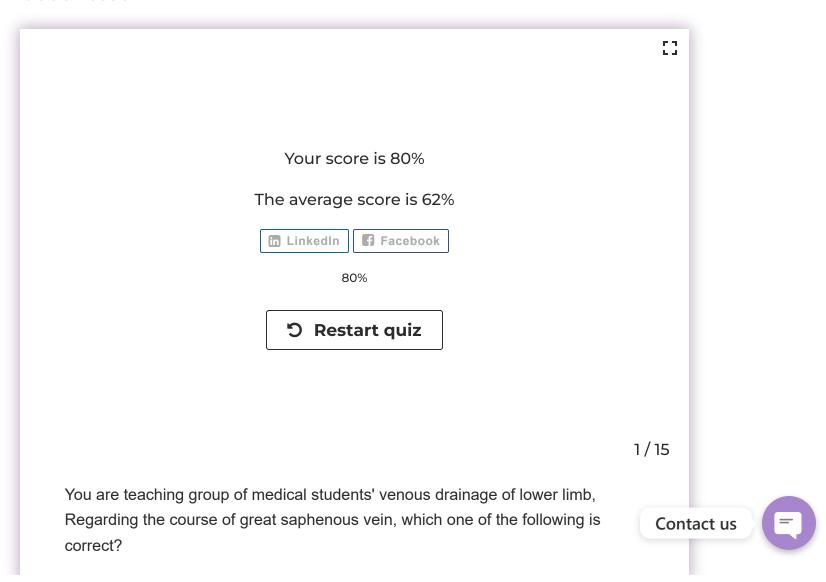
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• Overview •

E Comments

About Lesson



A. Runs behind the medial malleolus

B. Join the femoral vein above the inguinal ligament

C. Begins as the upward continuation of the lateral marginal vein of the foot

D. Travels with saphenous nerve along its course

E. Enters the femoral vein on its anteromedial side



- The great saphenous vein: originate from medial side of the dorsal venous arch in the foot, passes anterior to the medial malleolus (not posterior), travels up the medial side of leg, knee and thigh to pass in to saphenous opening in deep fascia covering the femoral triangle and join with the femoral vein below the inguinal ligament.
- The small saphenous vein: originate from lateral side of dorsal venous arch in the foot, passes posterior to lateral malleolus and up the back of leg to pierce the deep fascia and join the popliteal vein in popliteal fossa posterior to knee...
- Note: Cutaneous innervation to medial side of foot by=saphenous nerve (Recall).

2/15

A 50-year-old male presents to ED with the complaint of headache and chest pain, he is currently taking captopril and Hydrochlorothiazide for hypertension. Thiazide diuretic act at which of the following sites in nephron?



A. Thin ascending limb of loop of Henle

B. Late part of distal convoluted tubule

C. Early part of distal convoluted tubule



D. Collecting duct

E. Thick ascending limb of loop of Henle

- Thiazides act mainly on early segment of distal tubule where they inhibit the nacl reabsorption by binding to the Na-cl- cotransporter.
- while loop diuretic inhibits the Na-k-2CL- symporter on luminal membrane in the thick ascending limb of loop of Henle thus preventing the reabsorption of NaCl and water (RECALL)

3 / 15

A 54-year-old woman presents with acute back pain and complains of numbness around her rectum. Which dermatome best describes this area of numbness?

A. L5

B. S3

C. S2



D. S5 🗸

E. S1

S1	Little toe
S2	Popliteal fossa
S3	Buttocks (Ischial tuberosity)
S4 – S5	Perianal region (Recall)

4/15

A 27-year-old man falls from a ladder. Neurological examination reveals an isolated defect of proprioception. Which tract is most likely injured?

A. Lateral spinothalamic

B. Posterior spinothalamic tract

C. Dorsal column

D. Anterior spinothalamic

E. Lateral corticospinal



Dorsal column	Located: posteromedial aspect of spinal cord	Transmit ipsilateral proprioception, vibration and light touch sensation
Spinothalamic tract	Anterolateral aspect of cord	Transmit contralateral pain, crude touch and temperature sensation
Lateral corticospinal tract	Posterolateral aspect of cord	Control ipsilateral motor power

5/15

A 30-year-old man presents to the ED with an anterior shoulder dislocation while playing, now he is unable to initiate abduction of the arm following reduction of a dislocated shoulder. Which one of the following muscles is most likely injured?

- A. Teres minor
- B. Subscapularis
- C. Infraspinatus
- D. Teres major
- E. Supraspinatus

Supraspinatus is part of the rotator cuff group of muscles which initiate the abduction of shoulder from 0 to 15 degrees and then assists the deltoid with continued abduction. Supraspinatus muscle supplied by suprascapular nerve, "empty can test" use to examine this muscle.



11/5/23, 10:27 AM QUIZ: 12 | MRCEM EXPERT

• Teres minor muscle assessment test=Hornblower's test) **RECALL)**

- Subscapularis muscle assessment test (lift-off Test) RECALL
- Most commonly torn tendon of rotator cuff is supraspinatus muscle (RECALL)
- Teres minor and deltoid muscle innervated by Axillary nerve (RECALL)
- Supraspinatus Is innervated by suprascapular nerve
- Subscapular is innervated by subscapular nerve

6/15

Regarding the blood supply of abdomen, superior mesenteric artery supply which one of the following structures?

A. Ascending colon



B. Kidneys

C. Oesophagus

D. Descending colon

E. Sigmoid colon

1. coeliac trunk supply the

- Abdominal oesophagus
- stomach
- pancreas
- liver



- spleen
- gallbladder
- duodenum proximal to major duodenal papilla

•

2. Superior mesenteric artery supply the:

- Distal duodenum
- Jejunum
- Ileum
- cecum
- Appendix
- Ascending colon (RECALL)
- Proximal two third of transverse colon

3. Inferior mesenteric artery supply the:

- Distal transverse colon
- Descending colon (RECALL)
- Sigmoid colon
- Proximal rectum

7/15

Regarding the intrinsic muscles of hand, Froment's sign tests the function of which one of the following muscles?

A. Opponents pollicis

B. Flexor policies Longus



C. Flexor policies breves D. Abductor pollicis E. Adductor pollicis • Froment's sign: Patient is asked to hold a piece of paper between thumb and flat palm as paper is pulled away, patient will flex thumb at inter-phalangeal joint to maintain hold, this sign tests the function of adductor pollicis muscle which is supply by the ulnar nerve. (RECALL) 8 / 15 A young athlete presents to the ED after sustaining an injury to the right upper extremity. Physical examination reveals weak right forearm flexion and an absent biceps reflex. Given these findings, sensation loss in which of the following areas is most likely to be found in this patient? A. Lateral forearm B. Thenar eminence C. Medial forearm D. Posterior arm Contact us

E. Posterior forearm

11/5/23, 10:27 AM QUIZ : 12 | MRCEM EXPERT

Nerve	Motor supply	Sensory supply	Function
Musculocutane ous nerve	Anterior compartment of arm (coracobrachialis, biceps brachii, brachialis)	Lateral forearm (via the lateral cutaneous nerve of the forearm)	Supinator of forearm Also flex the arm at elbow and shoulder

<u>High yield:</u>

Biceps reflex	C5 – C6	Biceps brachii
Triceps reflex	C7 – C8	Triceps brachii
Knee jerk reflex	L3 – L4	Quadriceps (Recall)
Ankle	S1 (Recall)	Gastrocnemius

9/15

Which agent is released or secreted after a hemorrhage and causes an increase in renal Na* reabsorption?

A. Aldosterone

B. Angiotensinogen

C. Angiotensin I



D. Antidiuretic hormone (ADH)

E. Atrial natriuretic peptide

11/5/23, 10:27 AM

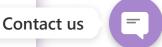
- Angiotensin I and aldosterone are increased in response to a decrease in renal perfusion pressure.
- Angiotensinogen is the precursor for angiotensin I.
- Antidiuretic hormone (ADH) is released when atrial receptors detect a decrease in blood volume. Of these,
- Atrial natriuretic peptide is released in response to an increase in atrial pressure, (Recall) and an increase in its secretion would not be anticipated after blood loss

Note: Renin is an enzyme produced by juxtaglomerular **cells of nephron (Recall)**

Renin Angiotensin- aldosterone system

Steps in the renin-angiotensin-aldosterone system

- A decrease in renal perfusion pressure causes the juxtaglomerular cells of the afferent arteriole to secrete renin
- Renin is an enzyme that catalyzes the conversion of angiotensinogen to angiotensin I in plasma.
- Angiotensin-converting enzyme (ACE) catalyzes the conversion of angiotensin I to angiotensin II, primarily in the lungs.



Angiotensin II has four effects:

- It stimulates the synthesis and secretion of aldosterone by the adrenal cortex. Aldosterone increases Na* reabsorption by the renal (distal tubule, thereby increasing extracellular fluid (ECF) volume, blood volume, and arterial pressure.
- It increases Na+-H exchange in the proximal convoluted tubule.
- It increases thirst and therefore water intake
- It causes vasoconstriction of the arterioles, thereby increasing TPR and arterial pressure

10 / 15

A 30-year-old male unable to laterally rotate his arm following fracture of surgical neck of humerus, which of the following muscle most likely to be involved?

A. Rhomboid major **X**



B. Teres minor



C. Teres major

D. Latissimus dorsi

E. Supraspinatus

• The axillary nerve is most commonly damaged due to fracture of surgical neck of humerus, which supply the teres minor muscle which



helps is lateral rotation of arm and also supply the deltoid muscle which cause abduction of arm...

• Axillary nerve root value =C5 and C6 (RECALL).

11 / 15

A 35 years old male presents to the ED with complaint of swelling in the right inguinal region. Regarding hernia which one of the following types protrudes through Hesselbach's triangle?

A. Direct inguinal hernia



B. Paraumbilical hernia

C. Indirect inguinal hernia

D. Femoral hernia

E. Spigelian hernia

Direct inguinal hernia lies medial to inferior epigastric vessels while indirect inguinal hernia lies lateral to inferior epigastric vessels. (RECALL)

- Most common type of inquinal hernia=indirect inquinal hernia (Recall)
- Most common side of inquinal hernia=Right side (RECALL)
- The floor of the inguinal canal is the inguinal ligament, otherwise known as the Poupart ligament, which is formed by the **external**



oblique aponeurosis (RECALL)

- Type of hernia that enters the deep inguinal ring=indirect inguinal hernia (RECALL)
- Type of hernia that protrudes through Hesselbach's triangle=**Direct** inguinal hernia (RECALL).

12 / 15

A 50-year-old man complains of intermittent abdominal pain on lifting and coughing. You suspect a Spigelian hernia. Weakness of which structure is most likely to be responsible?

- A. Transversalis fascia
- B. Iliopsoas fascia
- C. Transversus abdominus aponeurosis



D. Internal inguinal ring

E. Femoral sheath



- Spigelian hernia also known as hernia of Linea semilunaris is a protrusion through a defect in the aponeurosis of the transversus abdominis muscle.
- Clinically, they present as a small tender mass at the lower lateral edge
 of the rectus abdominus*. They have a high risk of strangulation, and s
 should be repaired urgently.



13 / 15

A 50-year-old male presents to the Emergency department with the complaint of swelling in ankle. She has recently been started on loop diuretics by her GP. loops diuretic act to inhibit the?

A. Na-K-2CL- channel

B. Na-K-ATPase

C. Na-K-channel

D. H-K- channel

- loop diuretic e.g.: furosemide inhibit the Na+k+2CL- symporter on luminal membrane in the thick ascending limb of loop of Henle thus preventing the reabsorption of Nacl and water
- while thiazides act mainly on early segment of distal tubule where they inhibit the Nacl reabsorption by binding to the Na+clcotransporter (RECALL).

14 / 15

A 55 years old male known case of HIV presented to the ED with Complain of Cough and breathlessness. You suspect pneumocystis jiroveci pneumonia, which

Contact us



E. carbonic anhydrase

one of the following is treatment of choice?

A. Respiratory Quinolones

B. Tetracyclines and sulfamethoxazole

C. Trimethoprim and sulfamethoxazole



D. Ceftriaxone

E. Gentamycin

- Trimethoprim and sulfamethoxazole is recommended first line treatment against pneumocystis jiroveci pneumonia.
- Note: Trimethoprim causes **folate deficiency** that's why teratogenic in early pregnancy.

15 / 15

A 20 years old male presents to the ED following stab wound to antecubital fossa with complaint of unable to flex his index and middle finger resulting in unopposed extension of index and middle finger. Which one of the following nerves is most likely injured?

A. Median nerve



B. Radial nerve



C. Musculocutaneous nerve

D. Ulnar nerve

E. Axillary nerve

common injuries affecting the median nerve include:

- Supracondylar fracture of humerus
- Stab wound to antecubital fossa
- Compression of carpel tunnel syndrome (RECALL)

Median nerve innervation

- Motor supply: all the anterior compartment of forearm muscles (Flexor compartment) (except flexor Carpi ulnaris and medial half of flexor digitorum profundus), the thenar muscles (flexor policies brevis, abductor pollicis brevis, opponent policies) and lateral two lumbricals are supplied by median nerve
- Sensory supply: lateral aspect of palm and palmar surface and fingertips of lateral three and half digits. (RECALL).

 \leftarrow Previous Next \rightarrow



Mark as Complete



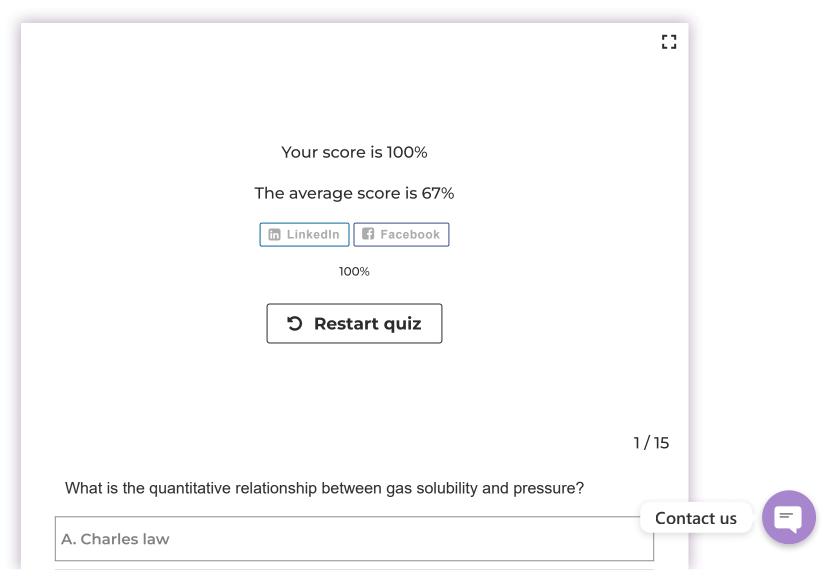
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• 🗐 Overview • 🖃 Comments

About Lesson



B. Entropy

C. Henry's law

D. Ficks law

E. Boyle's law

Henry's law: At a constant temperature, the amount of a given gas that
dissolves in a given type and volume of liquid is directly proportional to
the partial pressure of that gas in equilibrium with that liquid." An
equivalent way of stating the law is that the solubility of a gas in a liquid
is directly proportional to the partial pressure of the gas above the
liquid.

2/15

You have been asked to review a 32-year-old pastry chef. she sustained a laceration to her left thenar eminence while working. which of the following muscle is a part of the thenar eminence?

A. Abductor pollicis brevis



B. Extensor pollicis Longus

C. Flexor policies Longus



D. Extensor pollicis brevis

E. Abductor pollicis Longus

Thenar eminence muscles include:

- Abductor pollicis brevis
- Flexor policies brevis
- Opponents pollicis

Hypothenar muscles include: (RECALL)

- Abductor digitorum minimi
- Flexor digitorum minimi brevis muscle
- Opponents digitorum minimi muscle

3 / 15

An 18 years old young girl brought into the ED with severe respiratory depression. Her mum reports that she has finished packet of her sleeping pills, you suspect benzodiazepines overdose. Which one of the following drugs will reverse the effect?

A. Naloxone

B. Diazepam

C. Ramelteon



D. Doxepin

E. Flumazenil 💊

flumazenil is indicated to reverse the effects of benzodiazepines via antagonizing the Benzodiazepines receptor.

ANTIDOTES: (High yield)

Benzodiazepines = flumazenil

Lidocaine: Intralipid emulsion

Prilocaine: methylene blue

Tricyclic antidepressants: sodium bicarbonate

Metoclopramide = procyclidine

Opioid = naloxone (RECALL)

Organophosphate= atropine

Paracetamol poisoning= N-acetyl cysteine

Hyperkalemia = Ca gluconate (RECALL)

4/15

A 44-year-old male suffered from fracture of neck of the fibula now he is unable to Contact us do dorsiflexion of ankle, which one of the following nerves is most likely injured?



A. Femoral nerve

B. Tibial nerve

C. Obturator nerve

D. Sciatic nerve

E. Common peroneal nerve



- The common peroneal nerve is also known as common fibular nerve is a branch of sciatic nerve, arise at apex of popliteal fossa, continue by wrapping around the neck of fibula where it is most likely to be damaged (RECALL)
- Function: The common peroneal nerve Innervate the short head of the biceps femoris muscle. common fibular nerve innervates all the muscles of anterior and later compartments of the lower leg. The anterior muscular compartment of the lower extremity consists of the tibialis anterior muscle, the extensor hallucis longus muscle, and the extensor digitorum longus muscle. This compartment is responsible primarily for the dorsiflexion of the foot (RECALL).

5/15

A 65-year-old women with hypertension being treated with thiazide, her blood pressure responds well and reads at 120/75, after several months on the



medication, she complains of being tired and weak, which one of the following complications she has likely developed?

- A. Decreased glucose
- B. Decreased calcium
- C. Decreased potassium
- D. Decreased Sodium
- E. Decreased Uric acid
- Hypokalemia is common adverse effect of thiazide and furosemide, and cause fatigue and lethargy in the patient.
- Food rich in potassium, potassium chloride can correct the hypokalemia alternatively potassium sparing diuretics e.g., spironolactone may be added

Note: Calcium uric acid and glucose are usually elevated by thiazide. **Sodium loss wouldn't weaken the patient.**

6/15

A 55-year-old man who has been injured in car accident is brought into the ED, his blood alcohol level on admission is 280 mg/dl. Hospital record show a prior hospitalization for alcohol related seizure. his wife confirms that he has been



drinking heavily for 3 weeks. what treatment should be provided to treat this condition?

- A. Buspirone
- B. Phenytoin
- C. Lorazepam
- D. Phenobarbital
- E. Ketamine

It is important to treat the seizures associated with alcohol withdrawal, Benzodiazepines such as chlordiazepoxide, diazepam or short-acting lorazepam are effective in controlling this problem. they are less sedating than phenytoin or phenobarbital.

Note: lorazepam side effect=**respiratory depression (RECALL**). Should be used cautiously in a patient with muscular disease.

7/15

A 45-year-old man presents to the ED with pain around the back and side of his foot, he has been assessed by the physiotherapist who suspects tendonitis of his peroneus tendons, the peroneus Longus muscle attaches distally to which of the following structure?



QUIZ: 13 MRCEM EXPERT	
A. Base of 5th metatarsal and lateral cuneiform	
B. Base of 1st metatarsal and medial cuneiform	
C. Base of 5th metatarsal	
D. Calcaneal	
E. Lateral cuneiform	
Origin: Head of fibula, proximal 2/3 of lateral surface of fibula Insertion: inferior surface of the base of the 1st metatarsal and medial cuneiform bones.	
8 /	15
Which of the following best describes the Mechanism of action of lorazepam?	
A. Muscarinic receptors agonist	
B. Potentiate GABA release	
C. GABA antagonist	
D. Ca channel blocker	Contact us

E. Stimulate acetylcholine release

- Benzodiazepines e.g.: lorazepam is gamma amino butyric acid (GABA) receptors agonist
- GABA is the major inhibitory neurotransmitter in the central nervous system...
- Lorazepam overdose can be treated with a specific benzodiazepine antidote medication known as flumazenil (RECALL).

9/15

A 50-year-old patient presents to the ED with heartburn for which he is taking antacids daily, which of the following drug can be affected if taken with the combination of antacids?

A. Amlodipine

B. Simvastatin

C. Digoxin

D. Furosemide

E. Biguanide

• When antacids are taken with acidic drugs, for example, digoxin, phenytoin, chlorpromazine, and isoniazid they cause the absorption of



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the acidic drugs to be decreased, which causes low blood concentrations of the drugs, which ultimately results in reduced effects of the drugs.

10 / 15

A 35-year-old male patient brought into the ED by paramedics with history of RTA. He is bleeding profusely and undergoes shock with BP of 80/60 what will be the first response in this type of shock?

A. Sympathoadrenal activation

B. Baroreceptor

C. Cortisol

D. CNS ischemic response

E. RAAS

- Baroreceptors are mechanoreceptors located in the blood vessels near the heart. Baroreceptors function by sensing the pressure changes by responding to change in the tension of the arterial wall. The baroreflex mechanism is a fast response to changes in blood pressure.
- Changes in PH and Co2 sensed by Central and Peripheral Chemoreceptors (RECALL)
- Changes in Po2 sensed by = peripheral chemoreceptors only (RECALL)



• Changes in Arterial pressure sensed by = Baroreceptors (RECALL)

11 / 15

A 54-year-old patient is taking furosemide drug for his cardiac condition. Which one of the following complications patient will likely develop?

A. Hypokalemia 🗸	
B. Dyslipidemia	
	_

D. Hypercalcemia

C. Hyperkalemia

E. Hypertension

Loop diuretics adverse effects:

- hypokalemia and metabolic alkalosis
- hypomagnesaemia, hyponatremia, hypocalcemia, hypochloremia
- hyperuricemia
- acute hypovolemia
- ototoxicity
- blood disorder
- venous thromboembolism
- Hypokalemia is common adverse effect of thiazide and furosemide.



• **Hypokalemia management**: Food rich in potassium, potassium chloride can correct the hypokalemia alternatively potassium sparing diuretics e.g., spironolactone may be added.

12 / 15

A patient presents to emergency department with itching and swelling of lips, he is known to be allergic to nuts, he receives adrenaline but there is no improvement of symptoms. Which of the following drug is most commonly implicated as a cause of refractory anaphylaxis?

- A. Alpha blocker
- B. Ca channel blocker
- C. NSAIDs
- D. Beta blocker 🎻

E. Penicillin

• Adrenaline is drug of choice in the emergency management of acute allergic and anaphylactic reactions. Patient taking beta blocker may not respond to adrenaline therapy, beta blocker interacts with one of the receptor sites for adrenaline even adrenaline cause severe hypertension in patient taking non cardio selective beta blockers. If adrenaline is ineffective in treating anaphylaxis in patients taking b-blockers, then glucagon administration might be necessary (Recall).



Glucagon can reverse refractory bronchospasm and hypotension during anaphylaxis in patients on b-blockers by activating adenylyl cyclase directly and bypassing the b-adrenergic receptor

 Note: Anaphylactic reaction is IgE mediated released from mast cell and basophils (RECALL)

13 / 15

Regarding pathophysiology of asthma which one of the following neurotransmitters plays important role in bronchoconstriction?

A. Acetylcholine

B. Histamine

C. Anticholinergic

D. Serotonin

E. GABA

Histamine has been a well-known chemical mediator released from mast cells in the immediate allergic reaction for a long time and has been thought to have a critical role in the asthma pathophysiology



Students are asked to review a 25-year-old male who present to the ED after a road traffic accident, on examination students note weakness in his right hand and loss of sensation to the medial half of the palm. students suspect ulnar nerve injury, Ulnar nerve receives its fibers from which of the following nerve roots?

A. C5 -T1

B. C5 - C6

C. C5-C7

D. C8-T1

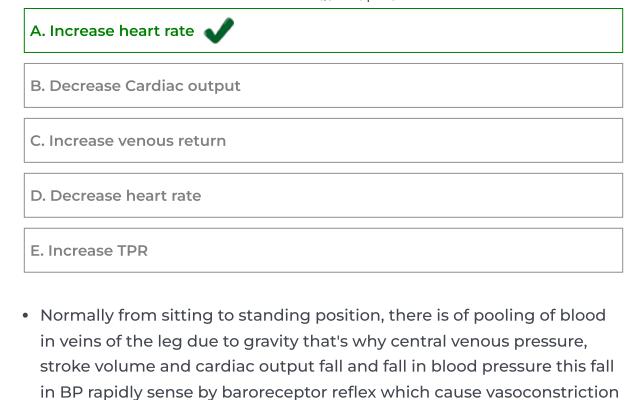
E. C7-C8

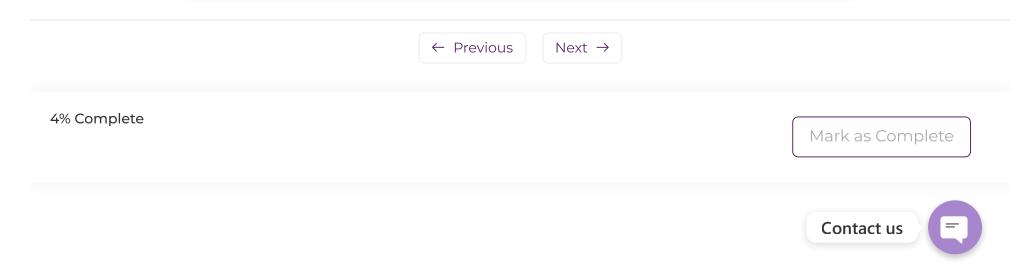
Ulnar Nerve Roots: C8 and T1.

- Musculocutaneous Nerve Roots: C5, C6, C7
- Axillary Nerve Roots: C5 and C6(RECALL)
- Median Nerve Roots: C6 T1. (Also contains fibers from C5 in some people).
- Radial Nerve Roots: C5 T1

Contact us

From sitting to standing there is compensation by which mechanism?





and an increase in heart rate and contractility, so restoring the stroke

volume, cardiac output and blood pressure.

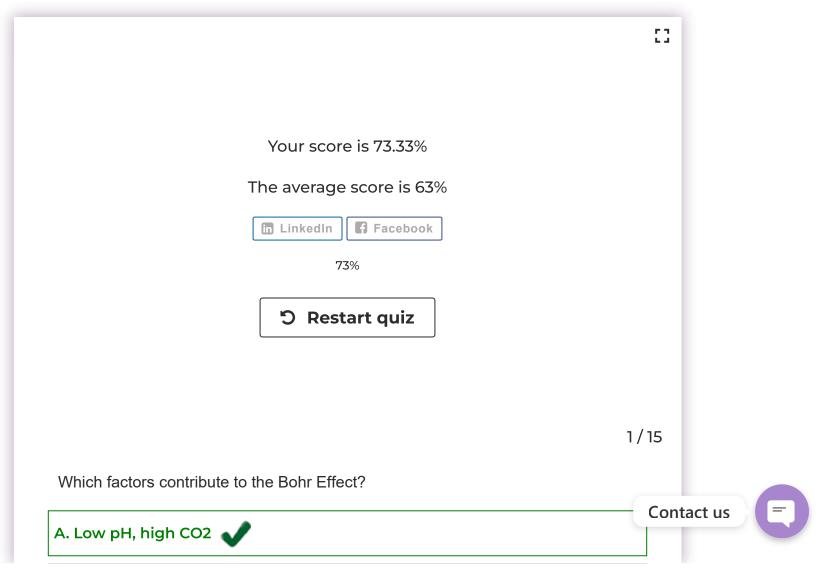
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About Lesson



B. High pH, low CO2

C. Low pH, low CO2

D. Low pH, high CO2, low temperature

E. Low pH, high CO2, high temperature

The Bohr effect describes hemoglobin's affinity for oxygen as a function of blood pH and carbon dioxide content. An increase in CO2 concentration will lower the blood pH, causing the hemoglobin affinity for oxygen to reduce. High temperature also causes oxygen to be released from hemoglobin but it's not related to Bohr's effect.

2/15

A 45-year-old man fell from a rooftop and presented with a head injury and hyperventilation. What could be the consequence of hyperventilation?

A. Increased in Pao2

B. Decrease in cerebral blood flow



C. Increase in cerebral blood flow



D. Decrease washout of Pco2



E. Increase in Pco2

- Co2 is vasodilator causes increases cerebral blood flow (Recall)
- Hypoventilation increases C02 and increases cerebral blood flow
- Hyperventilation causes decrease Pco2 and decreases cerebral blood flow

3 / 15

Which of the following is the site of highest air way resistance?

A. Largest bronchi

B. Alveoli

C. Smallest bronchi

D. Medium sized bronchi



E. Trachea

• The medium-sized bronchi actually constitute the site of highest resistance along the bronchial tree, although small radii of the alveoli might predict that they would have highest resistance, they don't because of parallel arrangement. In fact, early changes in resistance in small air ways may be silent and go undetected because of their small Contact us overall contribution to resistance.



A 40-year-old woman presents to the emergency department with painful swollen digit, the infection appears to have spread to the common flexor sheath. Which of the following digit is most likely to be involved with spread of infection to this location?

A. Index finger

B. Little finger

C. Middle finger

D. Ring finger

E. Thumb

- The synovial sheath of the little finger is usually continued with the common flexor sheath which is also called ulnar bursa thus infection of ulnar bursa most likely to involve the little finger.
- In a same way infection of thumb may spread to mid palmer space through the continuous synovial sheath of the flexor pollicis longus which is also called radial bursa.



Regarding central respiratory chemoreceptors, which of the following statement is correct?

- A. Respond directly to changes in external PCO2
- B. Located in the medulla near exit of cranial nerve X,XI
- C. Respond directly to changes in arterial PCO2
- D. Located in dorsal surface of medulla
- E. Respond to pH of CSF



Central chemoreceptors are sensitive to the PH of CSF, decrease in the pH of the CSF produce increase in breathing rate(hyperventilation). H+ doesn't Cross the blood brain barrier as well as co2 does. co2 diffuse from arterial blood into the CSF because co2 is lipid soluble and readily cross blood brain barrier. in the CSF, co2 combines with ho2 to produce H+ and HCO3-. the resulting H+ act directly on the central chemoreceptors, thus increase in pco2 and H+ stimulate the breathing and decrease in pco2 and H+ inhibit the breathing. this resulting hyperventilation or hypoventilation then returns the arterial Pco2 toward normal.



- Central chemoreceptors are located near the ventrolateral surface of the medulla.
- Peripheral chemoreceptors are located in carotid and aortic body. The carotid bodies are located at the bifurcation of common carotid arteries, the aortic bodies are located above and below the aortic arch.
- Decrease in arterial po2: stimulate the peripheral chemoreceptor and increase breathing rate. po2 must decrease to low levels (<60mmHg) before breathing is stimulated. when po2 is less than 60mmHg, breathing rate is exquisitely sensitive to po2.
- increase in arterial Pco2: stimulate the peripheral chemoreceptors and increase breathing rate
- increase in arterial H+: stimulate the carotid body peripheral chemoreceptors directly, independent of Changes in pco2.
- In metabolic acidosis, breathing rate is increased (hyperventilation) because arterial H+ is increased and pH is decreased.

The greatest increase in physiological dead space would be expected with which of the following conditions?

A. Pneumothorax

B. Atelectasis

C. Bronchoconstriction

D. Obesity

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E. Pulmonary embolism



Dead Space: Volume of ventilated air that does not participate in gas exchange.

Two types of Dead Space;

- 1: Anatomical Dead Space
- 2: Physiologic Dead Space
- 1: **Anatomical Dead Space** Volume of Air that fills the conducting Zone of respiration made up by the Nose, Trachea, and Bronchi. The value of anatomical Dead Space is 150 ml.
- 2: **Physiologic or Total Dead Space** Anatomic Plus Alveolar Dead Space (Volume of air in the Respiratory zone that does not take part in gas exchange).
- Respiratory Zone starts from Respiratory Bronchioles, Alveolar Duct, Alveolar sac, and Alveoli.
- In patients with acute PE, total dead space increases because lung units continue to be ventilated despite diminished or absent perfusion.

Causes of Increased Dead Space:

- Emphysema
- Pneumonia
- ARDS(RECALL)



- Smoking
- ETT intubation
- Bronchitis
- Asthma
- Cardiac Failure
- Pulmonary Embolism
- Neck Extension
- Standing
- Hypotension
- bronchodilation

Causes of decreased Dead Space:

- Atelectasis
- Tracheostomy
- Sleep
- Maxillectomy
- Hyperventilation
- Neck Flexion
- Supine Position
- Bronchoconstriction

7/15

During examination of cardiovascular system you are discussing heart sounds and cardiac cycle. which of the following stage of cardiac cycle occurs immediately after the aortic valve closes?

A. Ventricular ejection



B. Ventricular filling

C. Atrial systole

D. Isovolumetric relaxation



E. Isovolumetric contraction

Isovolumetric Relaxation

When the aortic and pulmonary valves close, the heart relaxes isovolumetrically because both the outflow valves and inflow valves are closed, and so no fluid moves across them. This phase lasts until the intraventricular pressure falls below the pressure in the atria, at which time the mitral and tricuspid valves open again. The isovolumetric relaxation lasts about 0.08 S. The volume throughout this phase is the end systolic volume, approximately 50 ml. The atrioventricular (AV) valves open at an atrial pressure of about 7 mmHg.

Isovolumetric relaxation:

- lasts about 0.08 seconds
- Aortic and pulmonary valves closed
- Mitral and tricuspid valves closed.

8/15

Contact us



Which one of the following nerves supply the skin above the eye brow extending back to the vertex of the scalp?

A. Greater occipital nerve

B. Supraorbital nerve



D. Zygomaticofacial nerve

E. Supratrochlear nerve



supraorbital nerve innervating the skin of upper eye lid and conjunctiva, skin of the upper forehead extending to the vertex of scalp.

9/15

Which among the following, prevents dislocation of femur backward at the knee joint?

A. Lateral cruciate

B. Middle cruciate

C. Anterior cruciate

D. Posterior cruciate





E. Medial deltoid ligament

Anterior cruciate prevents anterior dislocation of tibia on femur

Posterior cruciate prevents posterior dislocation of tibia onto femur

Note:

Unhappy triad: common in Rugby players. lateral blow to the extended knee with a twisting fall to the same side

 Refers to injury of Medial collateral, medial meniscus and anterior cruciate ligament

10 / 15

A 55-year-old patient presents to the emergency department with a persistent cough and hemoptysis. on x-ray you note hilar lymphadenopathy which of the following lymph nodes are most likely enlarged?

A. Bronchopulmonary lymph node



B. Inferior tracheobronchial lymph node

C. Cervical lymph node

D. Anterior mediastinal lymph node

E. Superior tracheobronchial lymph node



• The Bronchopulmonary lymph node most frequently involved in pathologies of lung.

11 / 15

Bilirubin is a byproduct of heme catabolism and is excreted in the bile and stool. Bilirubin is likely derived from?

- A. Mesangial cells
- B. Epithelial cells
- C. Enterocytes
- D. Red blood cells

E. Adipocytes

Heme is an important functional group of hemoglobin. Bilirubin, which is a byproduct of heme breakdown, comes from red blood cells. The liver receives unconjugated bilirubin from the blood and conjugates it via phase II metabolism to make it more soluble for excretion via the bile and stool. Fat cells (adipocytes), skin cells (epithelial cells), and small intestine absorptive cells (enterocytes) do not contain heme to be processed into bilirubin.



A 50-year-old male presents to the emergency department with complain of visual disturbance in his right eye on examination you note when you show a light in his right eye, neither his right or Left pupil constrict but when you show a light in his left eye both his left and right pupil constrict. which of the following nerve is most likely affected?

A. Oculomotor nerve

B. Optic nerve

C. Trigeminal nerve

D. Trochlear nerve

E. Abducens nerve

• Loss of afferent pupillary light reflex is seen in complete palsy of optic nerve. the ipsilateral direct and contralateral consensual reflexes are lost as the afferent optic nerve does not sense the light shown in affected eye but the contralateral direct and ipsilateral consensual reflexes are intact as the efferent oculomotor nerve is normal

13 / 15

Contact us



Fetal hemoglobin shifts the o2 saturation curve to left due to?

A. Increased P50

B. Decreased affinity for O2

C. Increased affinity for O2



D. Strongly bind with 2,3DPG

E. Decrease in pH

Fetal hemoglobin has a higher affinity for oxygen than adult hemoglobin. Maternal and Fetal blood never mix during pregnancy, but they come close to each other in the placenta. Oxygen diffuses easily to fetal hemoglobin here.

The reason fetal hemoglobin has a higher affinity for 02. It is composed of two alpha and two gamma subunits, while adult hemoglobin is composed of two alpha and two beta subunits.

2,3DPG present in RBCs enhance the ability of RBCs to release o2 near tissue and 2,3DPG only binds with beta globulin chains, fetal hemoglobin (HbF) lack of beta globulin chains that's why fetal hemoglobin has higher affinity for O2(RECALL).

Which of the following shift oxygen hemoglobin dissociation curve to left?

A. Decreased PH

B. Increased Pco2

C. Increased 2-3DPG

D. CO Poisoning

E. Increase temperature

<u>Leftward shift</u>: Increased affinity for oxygen (Less willing to give up oxygen)

- Increased affinity for oxygen (Less willing to give up oxygen)
- Increased pH
- Decreased pCO2
- Decreased temperature
- Decreased H+(RECALL)
- Decreased 2-3DPG
- CO (RECALLL)
- Methemoglobinemia
- Fetal hemoglobin (RECALL)

<u>Rightward shift:</u> Decreased affinity for oxygen (More willing to give up oxygen)



- Decreased ph (RECALL)
- Increased pCO2
- Increased H+
- Increased Temperature
- Increased 2-3DPG

Berry aneurysms are the most common type of intracranial aneurysm arising from which one of the following arteries?

A. Anterior Cerebral artery



B. Middle cerebral artery

C. Anterior communicating artery



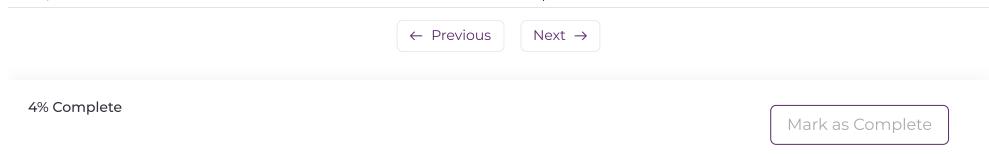
D. Posterior communicating artery

E. Posterior cerebral artery

- Anterior communicating artery is most common site of berry aneurysm. Second most common site is posterior communicating.
- Aneurysm of anterior communicating artery compress the optic chiasma and cause bitemporal hemianopia, aneurysm of posterior communicating artery may cause 3rd nerve palsy. (RECALL).



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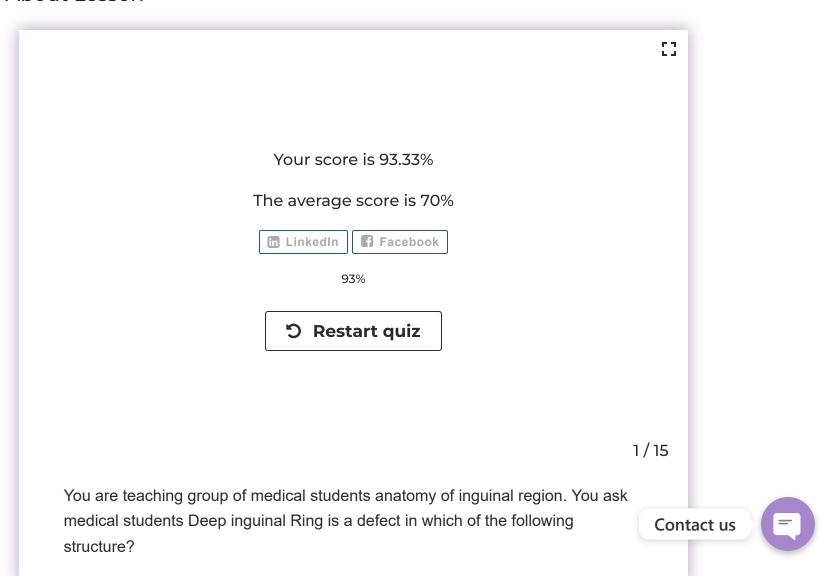
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Overview •

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About Lesson



A. Internal oblique aponeurosis	
B. External oblique aponeurosis	
C. Transversus abdominis aponeurosis	
D. Rectus abdominis aponeurosis	
E. Transversalis fascia 🕡	
Deep inguinal ring is formed by transversalis fascia. Superficial inguinal ring is formed by External Oblique. (Re	ecall)
	ecall)
	ecall) 2 / 15
Superficial inguinal ring is formed by External Oblique. (Re	
Superficial inguinal ring is formed by External Oblique. (Re	
Superficial inguinal ring is formed by External Oblique. (Reward Which vitamin is also known as anti-sterility vitamin? A. Vitamin C	

E. Vitamin K

vitamin e act as antioxidant prevents the cells from damage caused by free radicals. Sperm DNA damage is an emerging cause of male infertility that is likely to be more common among men with increased reactive oxygen species in the ejaculate. Vitamin E can protect the sperm membrane from oxidative damage and increased levels are associated with low levels of reactive oxygen species.

3/15

A 5-year-old male child brought into the ED with an infection after circumcision. The lymphatic from the penile skin and prepuce drains into which of the following group of lymph nodes?

- A. External iliac lymph nodes
- B. Internal iliac lymph nodes
- C. Deep inguinal lymph nodes
- D. Superficial inguinal lymph nodes



E. Para aortic lymph nodes

• Penile skin and prepuce = superficial inguinal lymph nodes



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- Glans penis and penile urethra=deep inguinal lymph nodes(recall)
- Scrotum=Superficial inguinal lymph nodes (RECALL)
- Testes= lumber or para-aortic lymph nodes (RECALL)
- prostate= internal iliac nodes (recall)

High Yield:

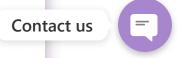
Pre aortic lymph nodes:

1.coeliac group of preaortic lymph nodes drain:

- Abdominal oesophagus
- Stomach
- Pancreas(recall)
- Liver
- Spleen
- Gallbladder
- Duodenum proximal to major duodenal papilla

2. Superior mesenteric group of preaortic lymph nodes drain:

- distal duodenum
- Jejunum
- Ileum
- Cecum
- Appendix
- Ascending colon
- Proximal two third of transverse colon



•

3. 3. Inferior mesenteric group of preaortic lymph:

- Distal transverse colon
- Descending colon
- Sigmoid colon
- Proximal rectum

Lumbar or Paraaortic lymph nodes:

- Kidney (Recall)
- Adrenal gland
- Testes (recall)
- Ovaries (recall)

4/15

Antidiuretic hormone (ADH) acts primarily at which of the following sites in renal nephron?

- A. Thick ascending limb of loop of Henle
- B. Proximal tubule
- C. Distal convoluted tubule and collecting ducts
- D. Descending limb of loop of Henle



E. Thin ascending limb of loop of Henle

Antidiuretic hormone (ADH), also known as vasopressin, is a small peptide hormone which regulates the body's retention of water. The main action of ADH in the kidney is to regulate the volume and osmolarity of the urine. Specifically, it acts in the distal convoluted tubule (DCT) and collecting ducts (CD).

- ADH synthesized by hypothalamus and secreted from Posterior pituitary (RECALL)
- ADH binds to V2 receptors on renal principal cells of late distal tubules and collecting ducts (RECALL)
- ADH also binds with V1 receptors on vascular smooth muscles.
- Central diabetes insipidus result from deficiency ADH secretion (RECALL)
- Nephrogenic diabetes insipidus result from inappropriate renal response to ADH

5/15

A 24-year-old female presents with severe headache, photophobia, and stiffness of her back. Physical examination reveals positive signs for meningitis. The attending physician decides to perform a lumbar puncture to determine if a pathogen is in the CSF. What is the last structure the needle will penetrate before reaching the CSF?

A. Ligamentum flavum



B. Posterior longitudinal ligament							
C. Arachnoid mater							
D. Pia mater							
E. Dura mater							

Lumber puncture needle Peirce in order:

• Skin

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- Subcutaneous tissue
- Supraspinous ligament
- Inter spinous ligament
- ligamentum flavum
- Epidural space
- Dura
- Arachnoid
- Sub arachnoid space (contain CSF)

Note: The subarachnoid space is filled with CSF which is produced by the choroid plexus within the ventricles of the brain.

6/15

you are prescribing ipratropium bromide for a patient who has presented with an exacerbation of her COPD. what is mechanism of action of ipratropium bromide?



A.	ΑI	D	ha	a	a	0	n	Ė	S

B. Beta agonist

C. Ca channel blocker

D. Muscarinic antagonist



E. Muscarinic agonist

Ipratropium is an acetylcholine antagonist via blockade of muscarinic cholinergic receptors. Blocking cholinergic receptors decreases the production of cyclic guanosine monophosphate (cGMP). This decrease in the lung airways will lead to decreased contraction of the smooth muscles.

7 / 15

Damage to Wernicke's area will most likely result in which of the following clinical features?

A. Dysarthria

B. Nystagmus

C. Expressive dysphasia





D. Receptive dysphasia



E. Visual loss

Broca's aphasia: This is a non-fluent aphasia which causes individuals to speak slower. It occurs when the brain's frontal lobe suffers damage. Individuals with Broca's Aphasia often feel frustrated due to being able to comprehend what others are saying, but unable to express themselves. also called Expressive dysphasia. Individuals affected only can speak in very short phrases, or have trouble getting words out. (RECALL)

Wernicke's aphasia: This is a fluent aphasia as this type of aphasia does not affect the speed of the individual's speech. Individuals with this type of aphasia have damage to their brain's temporal lobe. As a result, those of Wernicke's aphasia are sometimes unable to comprehend what others are saying, but are able to speak in long sentences. However, their communication doesn't follow standard grammar patterns and uses made-up words. also called receptive dysphasia.

8/15

A 55-year-old lady presents to the Emergency department with complaint of visual loss in Lower left quadrant in both visual fields. The lesion would most likely be in which of the following?



- A. Right occipital lobe
- B. Right temporal lobe
- C. Right parietal lobe



E. Left parietal lobe

Homonymous denotes a condition which affects the same portion of the visual field of each eye.

- Homonymous inferior quadrantanopia is a loss of vision in the same lower quadrant of visual field in both eyes whereas a homonymous superior quadrantanopia is a loss of vision in the same upper quadrant of visual field in both eyes.
- A lesion affecting one side of the temporal lobe may cause damage to the inferior optic radiations (known as the temporal pathway or Meyer's loop) which can lead to superior quadrantanopia on the contralateral side of both eyes (RECALL), if the superior optic radiations (parietal pathway) are lesioned, the visual loss occurs on the inferior contralateral side of the both eyes and is referred to as an inferior Quadrantanopia (RECALL).



A 55 years old male known case of hypertension presents to the ED with complaint of tingling and numbness in his right index finger. You suspect carpal tunnel syndrome. Which one of the following structures lie within the carpal tunnel?

- A. Pronator quadratus
- B. Ulnar nerve
- C. Ulnar artery
- D. Flexor pollicis longus tendon



E. Palmaris longus tendon

- The carpel tunnel is the space that lies between the flexor retinaculum. The ulnar nerve, ulnar artery and tendon of Palmaris longus runs superficial to flexor retinaculum and thus are not within carpel tunnel.
- Flexor pollicis longus enter the carpel tunnel before reaching its insertion on the distal phalanx of the thumb
- Pronator quadratus is confined to the distal forearm and does not reach the carpel tunnel.

Note: Carpal tunnel syndrome is caused by pressure on the median nerve (RECALL)



Epinephrine cause vasoconstriction by acting on which receptors?

A. Beta-2

B. AChR

C. Beta-1

D. Alpha-1

E. Alpha-2

- Alpha 1: vasoconstriction
- Alpha 2: vasodilation
- Beta 1: centrally increases automaticity, heart rate, myocardial contractility
- Beta 1: Peripherally vasodilates against alpha 1 vasoconstriction
- Beta 2 bronchodilation

11 / 15

A 54-year-old man presents with hematemesis. He has recent diagnosed with a pulmonary embolus and started on lmwh. What is the most appropriate treatment to prevent adverse effects of heparin?



A. Protamine sulfate

B. Fresh frozen plasma

C. Heparan sulfate

D. Prothrombin complex

E. Dextran sulfate

Common drugs and their antidote:

- Heparin=protamine sulphate
- Acetaminophen/paracetamol = Acetylcysteine
- Organophosphates = Atropine
- Digoxin=Digoxin immune fab
- Benzodiazepine= flumazenil
- Opioid= naloxone
- Iron=Deferoxamine
- Warfarin=Vitamin K, Fresh frozen plasma, Prothrombin complex concentrate
- Tricyclic antidepressants=Sodium bicarbonate
- Calcium channel blocker=Calcium chloride
- Theophylline poisoning=beta blocker
- Methotrexate=Leucovorin
- Aspirin=Sodium bicarbonate
- Beta blockers= glucagon



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• Insulin = glucose

• Isoniazid= vitamin B6

12 / 15

How does parathyroid (PTH) affect renal handling of calcium?

- A. Decrease calcium reabsorption in the distal tubule
- B. Decrease calcium reabsorption of proximal tubule
- C. Increase reabsorption of calcium at glomerulus
- D. Increase calcium reabsorption of proximal tubule



E. Increase calcium reabsorption in the distal tubule



- PTH increases calcium reabsorption exclusively in the distal nephron.
- 25-30% of dietary Calcium is absorbed from gut, out of this % of calcium, 50% is ionized (means free or unbound in plasma) and 45% is bound to albumin. Remaining 5% with other ions

Only free ionized Calcium is filtered freely in glomerulus:

- 70% absorbed in PCT (RECALL)
- 20% in thick ascending loop of Henle
- 9% in DCT
- 1% in Collecting duct



A patient complains of headache and visual loss. CT scan demonstrate a lesion of the temporal lobe what type of visual defect would u most expect to see in this patient?

- A. Contralateral homonymous hemianopia
- B. Bitemporal hemianopia
- C. Contralateral homonymous superior Quadrantanopia



- D. Homonymous hemianopia with macular sparing
- E. Contralateral homonymous inferior Quadrantanopia

Homonymous denotes a condition which affects the same portion of the visual field of each eye.

- Homonymous inferior quadrantanopia is a loss of vision in the same lower quadrant of visual field in both eyes whereas a homonymous superior quadrantanopia is a loss of vision in the same upper quadrant of visual field in both eyes.
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lesioned, the visual loss occurs on the inferior contralateral side of both eyes and is referred to as an inferior quadrantanopia.

14 / 15

Damage to Broca's area will most likely result in which of the following clinical features?

- A. Dysarthria
- B. Visual loss
- C. Expressive dysphasia
- D. Receptive dysphasia
- E. Nystagmus

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11/5/23, 10:31 AM QUIZ: 15 | MRCEM EXPERT

result, those of Wernicke's aphasia are sometimes unable to comprehend what others are saying, but are able to speak in long sentences. However, their communication doesn't follow standard grammar patterns and uses made-up words. also called receptive diaphasia.(RECALL)

15 / 15

30 years old male patient brought into ED Unresponsive after initial assessment you suspect opioid toxicity, what is the antidote of morphine toxicity?

A. Atropine sulphate

B. Flumazenil

C. N-acetyl cysteine

D. Esmolol

E. Naloxone

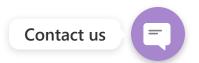
Naloxone is an opioid antagonist rapidly reverse the adverse effects of opioid toxicity.

← Previous

Next →

4% Complete

Mark as Complete



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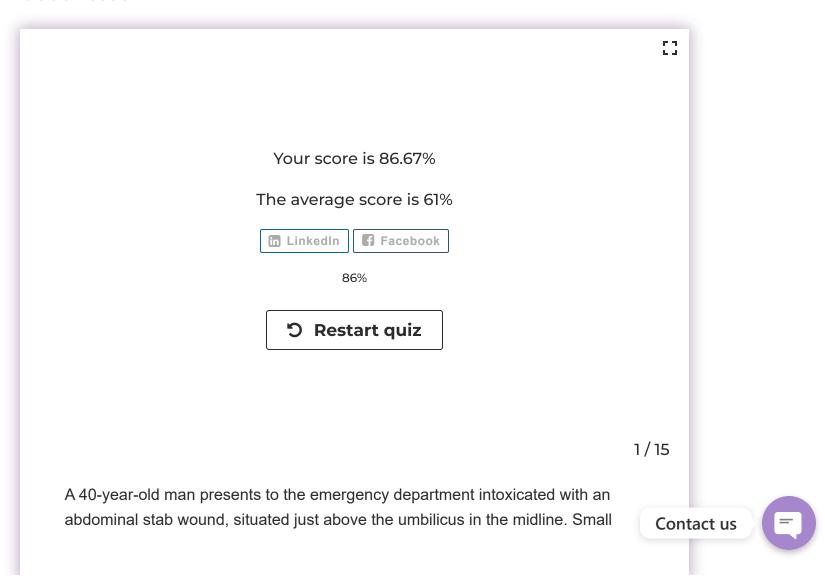
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bowel has herniated through the anterior abdominal wall through the hole created by the knife

The most superficial structure damaged in stabbing?

A. Camper's fascia 🛕



- B. Aponeurosis of internal oblique
- C. Scarpa's fascia
- D. Rectus abdominis muscle
- E. Transversalis fascia

Camper's fascia is the most superficial fatty layer of the anterior abdominal wall.

2/15

Carbonic anhydrase enzyme is present in which one of the following parts of nephron?

- A. The descending loop of Henle
- B. The collecting tubule and duct



C. The proximal convoluted tubules



D. The ascending loop of Henle

E. The distal convoluted tubules

- Carbonic anhydrase pre-dominant location is epithelial cells of the Proximal convoluted tubule
- Carbonic anhydrase catalyzes formation of Hco3- and H+ from H20 and Co2

3 / 15

Type-III hypersensitivity is triggered by?

A. IgM

B. Mast cells and IgE

C. Nk cells and IgG

D. T-cells

E. Deposition of antigen antibody complexes



Mechanism of hypersensitivity reactions:



Type I reactions (i.e., immediate hypersensitivity reactions) involve immunoglobulin E (**IgE**)-mediated release of histamine and other mediators from **mast cells and basophils.** (**RECALL**)

Type II reactions (i.e., cytotoxic hypersensitivity reactions) involve **immunoglobulin G or immunoglobulin M** antibodies bound to cell surface antigens, with subsequent complement fixation.

Type III reactions (i.e., Immune-complex reactions) involve circulating antigen-antibody immune complexes that deposit in post capillary venules, with subsequent complement fixation. An example is serum sickness.

Type IV reactions (i.e., delayed hypersensitivity reactions, cell-mediated immunity) are **mediated by T cells** rather than by antibodies **(RECALL).**

4/15

A 55-year-old female with history of fall brought into the ED with complain of Severe right hip pain. Xray reveals posterior hip dislocation, which one of the following ligaments is torn in posterior dislocation of hip?

A. All the extracapsular ligaments

B. Pubofemoral

C. Ligament of head of femur

D. Ischiofemoral



E. Iliofemoral

Intracapsular

The only intracapsular ligament is the **ligament of head of femur**. It is a relatively small structure, which runs from the acetabular fossa to the fovea of the femur.

Extracapsular ligaments:

Iliofemoral ligament: Strongest of all located anteriorly (Recall)

Ischiofemoral: Reinforcing the capsule posteriorly.

Pubofemoral: Reinforcing the capsule anteriorly and inferiorly

Note: Most common hip dislocation is posterior and sciatic nerve is most commonly injured (Recall).

5 / 15

A 23-year-old male presents to the ED with a lacerated wound on his wrist. You ask junior fellows wrist joint is an example of ?

A. Synovial pivot joint

B. Synovial condyloid joint



D. Synovial plane joint

E. Synovial hinge joint

Wrist joint: Synovial condyloid joint

Sternoclavicular joint: Synovial saddle-shaped joint

Acromioclavicular joint: Synovial plane joint

Shoulder joint: Synovial ball and socket joint

Elbow joint: Synovial hinge joint

Radioulnar joints: Synovial pivot joint

The joint between atlas and axis is Pivot joint

6/15

A 45-year-old woman with a newly diagnosis of type ii diabetes has significant hyperglycemia.

What is the most likely cause of her elevated blood glucose?

A. Production of abnormal insulin

B. Increased cellular resistance to insulin



C. Reduced insulin production by pancreatic beta cells

D. Excessive glucocorticoid production

Contact us



11/5/23, 10:36 AM

E. Reduced glucagon secretion

Type 2 diabetes mellitus is characterized by hyperglycemia, insulin resistance, and relative impairment in insulin secretion.

7/15

Regarding respiratory muscles, which one of the following muscles is a forced muscle of expiration?

- A. Sternocleidomastoid
- **B. Scalenus Medius**
- C. Rectus abdominis
- D. Scalenus anterior
- E. External Intercostal

Muscles of forced expiration include:

- Anterior abdominal muscles (rectus abdominis is the main muscle)
- internal Intercostal muscles
- External intercostal muscles are the muscles of inspiration.



You are asked to review a 16-year-old girl who presents with a right shoulder dislocation. This is her seventh right shoulder dislocation within a year. You suspect a hypermobility or ligament pathology. Which one of the following ligaments is most likely injured in acromioclavicular fracture?

- A. Glenohumeral ligaments
- B. Coracohumeral ligament
- C. Coracoacromial ligament
- D. Transverse humeral ligament
- E. Coracoclavicular ligament



Acromioclavicular joint

TYPE= Plane type synovial joint

The acromioclavicular joint consists of an articulation between the **lateral end** of the clavicle and the **acromion** of the scapula

LIGAMENTS OF THE JOINT

There are three main ligaments that support the acromioclavicular joint



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• Acromioclavicular ligament

- Conoid ligament
- Trapezoid ligament

Collectively, the conoid and trapezoid ligaments are known as the **coracoclavicular ligament**. It is the **strongest ligament** and suspends weight of the upper limb

High yield:

The shoulder joint

Type: synovial ball and socket joint

Shoulder joint is formed by the articulation of the **head** of the humerus with the **glenoid cavity** of the scapula

Ligaments of the shoulder joint:

In the shoulder joint, the ligaments play a key role in stabilizing the bony structures.

- Glenohumeral ligaments (superior, middle and inferior) They act to stabilize the anterior aspect of the joint. They are the main source of stability for the shoulder (Recall), holding it in place and preventing it from dislocating anteriorly.
- **Coracohumeral ligament:** It supports the superior part of the joint capsule.
- Transverse humeral ligament: This ligament spans the distance between the two tubercles of the humerus. It holds the tendon of the



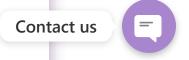
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long head of the biceps in the intertubercular groove

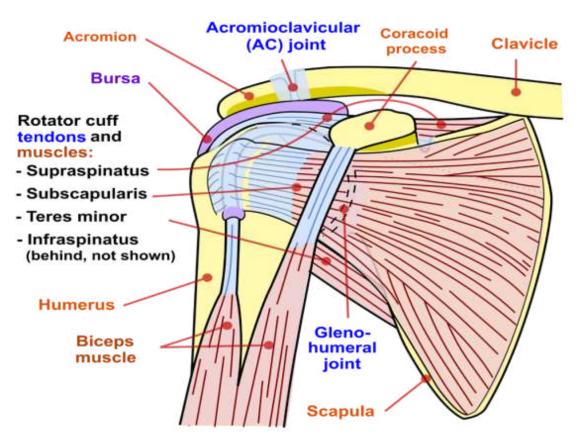
- Coraco-clavicular ligament: This ligament composed of the trapezoid and conoid ligaments and runs from the clavicle to the coracoid process of the scapula. They work alongside the acromioclavicular ligament to maintain the alignment of the clavicle in relation to the scapula.
- Coracoacromial ligament. This ligament runs between the acromion and coracoid process of the scapula it forms the coraco-acromial arch.
 This structure overlies the shoulder joint, preventing superior displacement of the humeral head.

Stability of the joint

- Rotator cuff muscles [SITS MUSCLES] Recall
- **Glenoid labrum: A** fibrocartilaginous ridge surrounding the glenoid cavity
- Ligaments: Extra Capsular ligaments form the coraco-acromial arch.
- **Biceps tendon** it acts as a minor humeral head depressor, thereby contributing to stability.



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Movements of the shoulder joint: Shoulder joint is highly mobile ball and socket joint allows various movements like flexion, extension, adduction, abduction, medial rotation, lateral rotation and circumduction

CLINICAL PEARL:

Shoulder joint dislocations



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Anterior shoulder dislocation: Most common injury results from forceful abduction, extension and external rotation

Clinical features:

- Arm usually abducted and externally rotated
- Humeral head often palpated anteriorly
- Patient cannot touch contralateral shoulder with hand of affected extremity.

Complications of anterior shoulder dislocation:

- Injury to axillary nerve (Recall)
- Injury to axillary artery
- Injury to rotator cuff

Posterior Shoulder dislocation: occurs occasionally results from direct blow to the arm that produces forceful internal rotation and adduction.

Clinical features:

- · Arm usually adducted and internally rotated
- Patient unable to perform external rotation

Complications of posterior shoulder dislocation [less common neurovascular injury]

- Fracture of posterior glenoid labrum
- Fracture of humeral shaft or lesser tuberosity

Note: **Light bulb sign** on the X-ray is the diagnostic feature of posterior shoulder dislocation

9/15

A 22-year-old woman involved in a road traffic accident sustains a fractured pelvis. You suspect an injury to sciatic nerve.

Which joint movements are most likely to be affected?

- A. Hip adduction and flexion
- B. Hip adduction and extension
- C. Hip rotation and knee flexion
- D. Extend thigh at hip and knee flexion



E. Hip adduction and rotation

- Sciatic nerve Innervates the muscles of the posterior compartment of thigh (biceps femoris, semimembranosus and semitendinosus) and the hamstring portion of the adductor magnus (remaining portion of which is supplied by the obturator nerve).
- Sciatic nerve extend thigh at hip joint and flex leg at knee joint.



A 70-year-old man who is a chronic smoker presents with shortness of breath. An arterial blood sample shows a raised PCO2. Which finding would best indicate this is a long-standing increase in arterial PCO2?

- A. Decreased urinary ammonium salts
- B. Decreased plasma potassium concentration
- C. Increased renal potassium excretion
- D. Increased renal bicarbonate formation



E. Increased urinary bicarbonate excretion



Respiratory acidosis: Compensated by Increased renal bicarbonate formation and resulting metabolic alkalosis

Metabolic acidosis: Compensated by decreased Pco2 formation through hyperventilating and resulting in respiratory alkalosis.

11 / 15

Regarding the sole of foot, which one of the following muscles is a part of 1st layer of foot?



QUIZ: 16 | MRCEM EXPERT 11/5/23, 10:36 AM

A. Lumbricals

B. Abductor hallucis



C. Adductor hallucis

D. Flexor hallucis Brevis



E. Interosseous muscles

Muscles of sole of foot. (4 layers)

- First layer: abductor hallucis, flexor digitorum brevis & abductor digitorum minimi
- Second layer: flexor digitorum accessorius, 4 lumbricals and tendons of flexor hallucis longus and flexor digitorum longus
- Third layer: flexor hallucis brevis, flexor digitorum minimi brevis & adductor hallucis
- Fourth layer: Plantar and dorsal interossei muscles, Two long tendons of extrinsic muscles - tibialis posterior and peroneus longus.

12 / 15

A 72-year-old woman with a history of progressively worsening dysphagia is discovered to have an oesophageal tumor. The tumor is located on the anterior aspect of the thoracic oesophagus. Which of the following is an anterior relation of the thoracic oesophagus?



- A. Lesser sac of peritoneum
- B. Subclavian artery
- C. Right vagus nerve
- D. Azygous veins

E. Left recurrent laryngeal nerve



Anterior relation of oesophagus	Posterior relation of oesophagus
 Trachea Left recurrent laryngeal nerve Pericardium 	 Thoracic vertebral bodies Thoracic duct Azygous veins Descending aorta

- Note: Larynx: Innervation to the intrinsic muscles of the larynx is achieved via the recurrent laryngeal nerve. Injury of recurrent laryngeal nerve may result in hoarseness (Recall), respiratory obstruction and inability to speak
- superior laryngeal nerve provides both motor and sensory function to different areas of the throat and mouth that are primarily involved in speech (Recall) and keeping food and drink out of your airway.



• The superior laryngeal nerve (SLN) provides motor innervation to the cricothyroid muscle.

13 / 15

Taste sensation from anterior 2/3 of tongue is carried by?

A. Glossopharyngeal

B. Trigeminal nerve

C. Vagus nerve

D. Facial nerve



- The chorda tympani branch of the facial nerve supplies taste sensation to the anterior 2/3 of the tongue (RECALL).
- In the anterior 2/3, general sensation is supplied by the trigeminal nerve (CNV). Specifically, the lingual nerve, a branch of the mandibular nerve (CN V3). (RECALL)
- The posterior 1/3 of the tongue both touch and taste are carried by the glossopharyngeal nerve (CNIX) (RECALL).



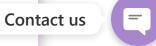
A comatose patient has a respiratory rate of 5 breaths per minute following an overdose of heroin. He receives naloxone and his respiratory rate rapidly improves to 16 breaths per minute. Which component of arterial blood gas sampling is most likely to rapid decrease following this intervention?

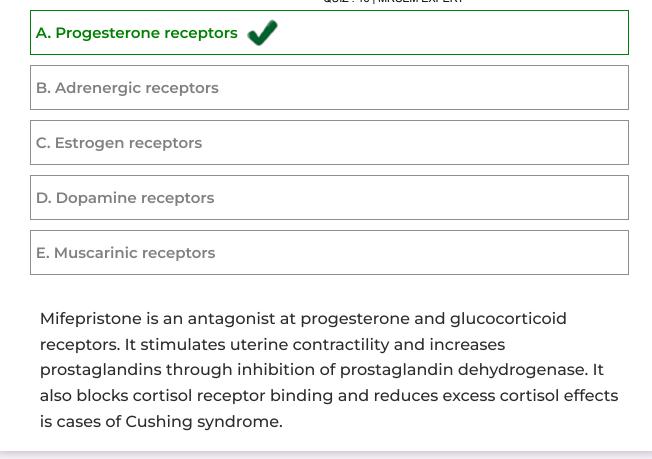
A. Base excess
B. pH
C. Po2
D. Hco3
E. Pco2

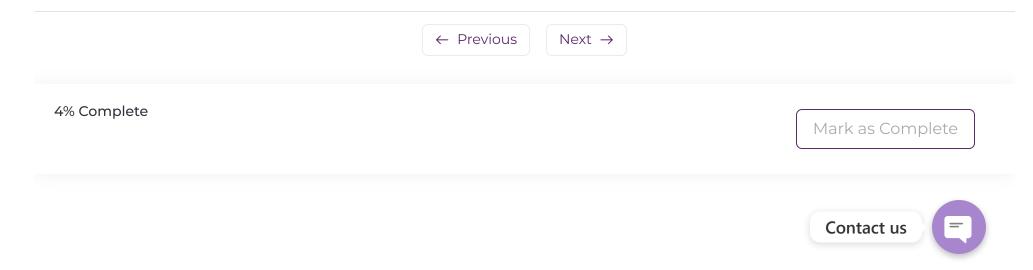
- Co2 is vasodilator causes increases cerebral blood flow (Recall)
- Hypoventilation increases C02 and increases cerebral blood flow
- Hyperventilation causes decrease Pco2 and decreases cerebral blood flow

15 / 15

Mifepristone is indicated in the medical termination of pregnancy. It acts as an antagonist at which one of the following receptors?







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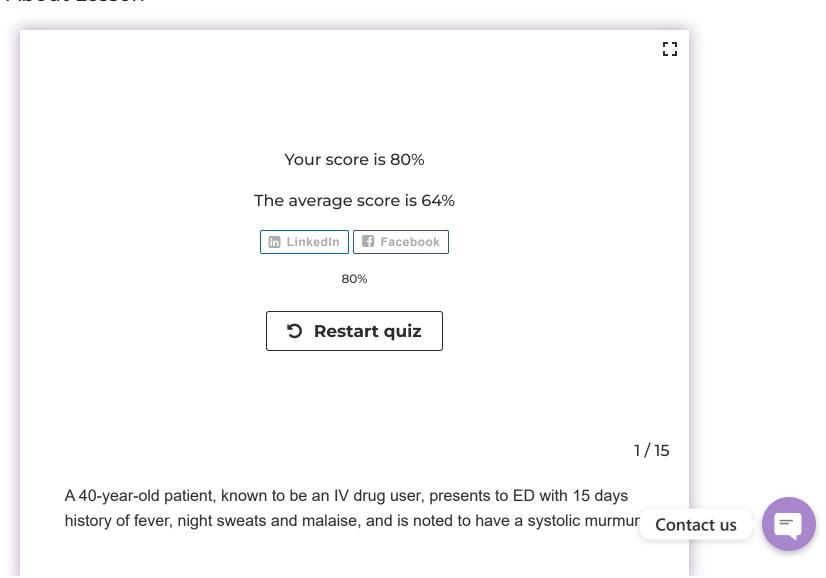
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Overview •

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About Lesson



on examination. You suspect acute infective endocarditis, which of the following pathogens is the most likely cause?

A. Staph epidermidis

B. Staphylococcus aureus



C. Staph viridans

D. Streptococcus pyogenes

E. Pseudomonas aeruginosa

High Yield:

- Most common cause generally: Staph Aureus (Recall)
- Most common cause in IV drug abuser: Staph Aureus
- Most common cause of infective endocarditis in prosthetic heart valves:
 Staph epidermidis
- Most common cause of infective endocarditis after tooth extraction surgery: Staph viridians

2/15

A 42-year-old male with history of assault presents to the ED with complaint of incised wound on the neck. Which one of the following arteries is most likely injured?



QUIZ : 17 MRCEM EXPERT	
A. Vertebral artery	
B. Basillar artery	
C. Brachial artery	
D. Facial artery	
E. Internal carotid artery	
Neck injury may result in the laceration of major vessels, potentially leading to hemorrhagic shock. Internal carotid artery is most likely injured.	
	3/15
A 45-Year-old male suffered penetrating trauma to the parotid gland with facial nerve injury presents with complaint of inability to purse lips. Which of the following terminal branch of facial nerve is most likely injured?	
A. Buccal branch	
B. Greater petrosal nerve	
C. Temporal branch	Contact us

D. Marginal mandibular branch

E. Zygomatic branch

	Facial nerve branches in temporal bone	Facial nerve terminal branches in the parotid gland
•	Chorda tympani: taste from Ant 2/3 of tongue (RECALL) While Ant 2/3 of general sensation of tongue: mandibular division of trigeminal nerve	 Temporal branch: innervate muscles in the temple, forehead (Frontalis muscle) and supraorbital areas (upper half of orbicularis oculi muscle). Occipitofrontalis muscle: Frontal belly: Elevates eyebrows, wrinkles skin of forehead innervated by temporal branch Occipital belly: Retracts scalp innervated by posterior auricular nerve
•	<u>Greater petrosal nerve:</u> Parasympathetic innervation to lacrimal and mucous glands	Zygomatic branch: innervate muscles in the infraorbital area (Lower half of orbicularis oculi muscle) Recall lateral nasal area and upper lip
		Buccal branch: muscles in the cheek and upper lip (Recall) Pursing of the lips
		Marginal mandibular branch: innervate muscles of lower lip and chin.



A 34-year-old man presents to the ED complaining of a green urethral discharge and dysuria. He reports unprotected sexual intercourse with a new partner 3 days ago. What is the most likely causative organism?

- A. Treponema pallidum
- B. Trichomonas vaginalis
- C. Neisseria gonorrhoeae
- D. Chlamydia trachomatis
- E. Gardnerella vaginalis

Neisseria gonorrhoeae Gram –Ve diplococci transmitted through Sexual and peripartum causing Urethritis, epididymoorchitis, PID, septic arthritis, neonatal conjunctivitis (ophthalmia neonatorum)

Note: **Urethritis in 1st week (3-4 days)** post exposure and unprotected sex while **Chlamydia trachomatis causes urethritis after 2-3 weeks** post exposure and unprotected sex



Which one of the following pathogens causes ophthalmia neonatorum occurring in the 1 28 days of life?

- A. Gardnerella vaginalis
- B. Chlamydia trachomatis
- C. Neisseria gonorrhoeae



- D. Treponema pallidum
- E. Trichomonas vaginalis

Ophthalmia neonatorum is conjunctivitis occurring within the first 4 weeks of life.

The most serious cause is infection with Neisseria gonorrhea in first week most likely in 3-4 days of life, but in the UK, it is caused more commonly by Chlamydia in first 28 days of life.



A 33-year-old woman presents with severe headache and double vision. She has had severe facial pain and purulent nasal discharge for the past week. CT shows cavernous sinus thrombosis. Which one of the following veins is source of infection of cavernous sinus?

A. Facial vein



B. Azygous vein

C. Ophthalmic vein



D. Middle cerebral vein

E. Central vein of retina

Cavernous sinus thrombosis (CST) refers to the formation of a clot within the cavernous sinus. It is important to note that the superior ophthalmic vein forms an anastomosis with the facial vein. Therefore, the ophthalmic veins represent a potential route by which infection can spread from an extracranial to an intracranial site.

Note: The abducens nerve (CN VI) is most commonly affected in cavernous sinus thrombosis



Structures passing through cavernous sinus

useful mnemonic: O TOM CAT

OTOM (oculomotor nerve, trochlear nerve, ophthalmic branch, maxillary branch) refers to the lateral wall contents from superior to inferior

CAT (internal **c**arotid artery, **a**bducens nerve, **t**rochlear nerve) refers to the horizontal contents, from medial to lateral.

7 / 15

A 25-year-old man attends the ED with abdominal pain. He has a history of Crohn's disease and has had a previous resection of his terminal ileum.

Which of the following is most likely to be deficient due to the absence of the terminal ileum?

- A. Dietary protein
- B. Dietary carbohydrate
- C. Vitamin D
- D. Zinc
- E. Vitamin C

Maximal water reabsorption occurs in Jejunum (Recall)

- Maximal Iron absorption occurs in duodenum (Recall)
- Maximal calcium absorption occurs in duodenum (Recall)
- Maximal vit B12 and vit D absorption occurs in terminal ileum

8/15

17 years old female presented to the ED with complaint of fever since 3 days lethargy, stiff neck and non-blanching skin rash that appears on the lower limb.

What is the most likely diagnosis?

A. Endocarditis

B. HSP

C. Meningococcal Septicemia 🕡



D. Rheumatic fever

E. Autoimmune TTP

9/15

Blood brain barrier is the barrier between cerebral capillary blood and the CSF consists of which one of the following cells?



A. Oligodendrocytes B. Endothelial cells 🕡 C. Plasma cells D. Ependymal cells E. Astrocytes Blood brain barrier is the barrier between cerebral capillary blood and the CSE CSF fills the ventricles and the subarachnoid space. It consists of the endothelial cells of the cerebral capillaries and the choroid plexus epithelium. 10 / 15 A 40-year-old woman presents with a lump in the lateral upper right quadrant of her breast. You are suspicious this is breast cancer. Which lymph node would be most likely to be affected first? A. Supraclavicular B. Parasternal Contact us C. Axillary

D. Subclavian

E. Interpectoral

The lymphatic drainage of the breast is of great clinical importance due to its role in the **metastasis** of breast cancer cells.

There are three groups of lymph nodes that receive lymph from breast tissue

- Axillary nodes (75%): Receives lymphatic drainage from lateral and superior quadrant of breast
- parasternal nodes (20%): Receives lymphatic drainage from medial quadrant

Note: Breast cancer in axillary tail of breast most commonly involved lymph node is axillary (Recall).

11 / 15

A 25 years old woman from sub–Saharan Africa presents to the ED with complaint of fever and chills. Thick and thin films reveal malarial parasite. which organism would most likely be seen?



QUIZ: 17 MRCEM EXPERT	
A. Plasmodium vivax	
B. Plasmodium falciparum 🗸	
C. Plasmodium knowlesi	
D. Plasmodium ovale	
E. Plasmodium malariae	
1. falciparum is the deadliest malaria parasite and the most prevalent on the African continent. P. vivax is the dominant malaria parasite in mos countries outside of sub-Saharan Africa.	
Note: The Giemsa stain (Thick and thin film. Recall) is used as the gold standard for the diagnosis of malaria on blood smears.	
12	. / 15
A 10 years old child brought into the ED with complaint of tiredness, fever and joint pain. His mother states that he had acute sore throat 10 days back. You suspect acute rheumatic fever secondary to untreated sore throat. Rheumatic fever is immunological sequalae of which of the following pathogens?	
A. Pseudomonas aeruginosa	
B. Staph viridians	Contact us

C. Streptococcus pyogenes



D. Staphylococcus aureus

E. Staph epidermidis

Streptococcus Pyogenes is gram +Ve Cocci in chains

- Beta hemolytic group A
- Causes acute sore throat in children
 (Recall), skin and soft tissue infection and necrotizing fasciitis
- Erysipelas: Superficial skin infection involving upper dermis and superficial lymphatics caused by Group A beta hemolytic streptococcus pyogenes (Recall)

Post-infectious immune-mediated reactions of Streptococcus Pyogenes include Rheumatic fever, erythema nodosum, acute glomerulonephritis

Streptococcus Pyogenes



A 48-year-old man is found to have a right lower limb weakness and sensory loss. He also has apraxia. You suspect a stroke.

Occlusion of which artery is most likely to cause these symptoms?

- A. Posterior communicating artery
- B. Internal carotid artery
- C. Middle cerebral artery
- D. Anterior cerebral artery
- E. Basilar artery

High Yield: Clinical effects of occlusion of cerebral arteries



Blood vessel	Clinical effects of occlusion of cerebral arteries
Anterior cerebral artery	 <u>Frontal lobe</u>: contralateral weakness in lower limb, dysarthria, dysphasia, apraxia and urinary incontinence <u>Parietal lobe</u>: contralateral somatosensory loss in the lower limb
Posterior cerebral artery	 Occipital lobe: contralateral homonymous hemianopia with macular sparing, cortical blindness (if bilateral) Temporal lobe: memory deficit Occipitotemporal region: prosopagnosia, and color blindness
Middle cerebral artery	 Frontal lobe: contralateral weakness (face/arm greater than leg), conjugate deviation of the eyes to affected side, expressive dysphasia. Temporal lobe: deafness (if bilateral), receptive dysphasia, auditory illusions and hallucinations, contralateral superior quadrantanopia. Parietal lobe: loss of sensory discrimination, hemineglect, apraxia, contralateral inferior quadrantanopia (RECALL)

Note: Pontine infarct /Stroke: Results in ipsilateral facial and contralateral limb weakness (Recall).



An 87-year-old woman from a residential home with a 2-day history of diarrhea. She has had 10 episodes of watery diarrhea but no vomiting. She complains of colicky lower abdominal pain. She had a 5-day course of antibiotics for a chest infection 2 weeks ago. Observations show a respiratory rate 18 bpm, Sp02 95% in air, heart rate 89 bpm,

BP 146/89 mmHg, temp 36.8'C and BM 5.6 Examination reveals that her abdomen is soft but there is generalized tenderness especially across her lower abdomen. What is the most likely causative organism?

A. E. coli

B. Norovirus

C. Campylobacter

D. Clostridium difficile

E. Rotavirus

Broad spectrum antibiotics disturb the normal gut flora and cause overgrowth of clostridium difficile spores and causing Pseudomembranous colitis



Clostridium	Gram +Ve rod produces
Tetani	exotoxin tetanospasmin
	(Recall) causes tetanus
Clostridium	Gram +Ve rod Spore-
Difficile	forming, Produces Toxin A
	(enterotoxin) and Toxin B
	(cytotoxin) causes
	Pseudomembranous colitis
Clostridium	Gram +Ve rod Spore-
Perfringens	forming, produces
	exotoxin causes Gas
	gangrene (Recall)
Clostridium	Gram +Ve rod Spore-
botulinum	forming, produces
	exotoxin botulinum.
	Botulinum toxin, the most
	potent of the neurotoxins,
	produces paralysis by
	blocking presynaptic release
	of the neurotransmitter
	(acetylcholine) at the
	neuromuscular junction
	(Recall)

Antibiotics causing clostridium difficile colitis: Co-Amoxiclav, Cephalosporins, Clindamycin and quinolones

Treatment of choice of clostridium difficile colitis is Vancomycin (Recall)

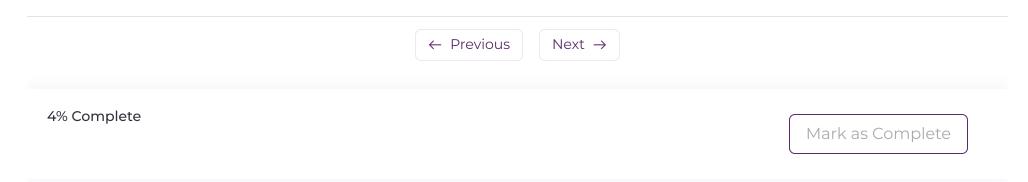
15 / 15

22 years old young female came into ED with complain of sudden onset of lower limb weakness. She has history of Sore throat 10 days ago. On Examination her reflexes are absent in his lower limbs. What is the most likely causative organism?

- A. Staphylococcus aureus
- B. Salmonella
- C. Clostridium perfringens
- D. Clostridium difficile
- E. Campylobacter jejuni

GBS cases seem to occur after a viral or bacterial infection like those that cause sore throats or diarrhea characterized by lower limb weakness, paresthesia and hyporeflexia



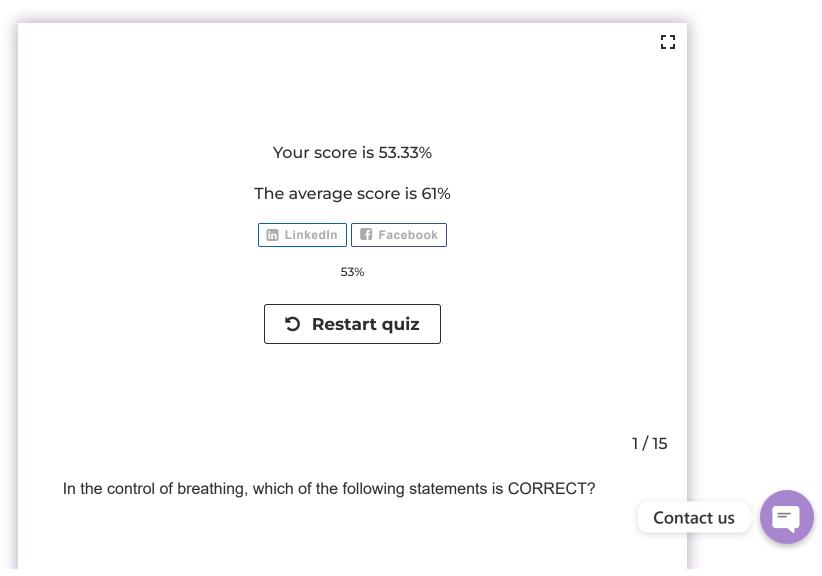


 $\leftarrow \begin{array}{l} \text{Mrcem Primary Complete Course ,High Yield Stuff and Similar to Previous Exam Questions With} \\ \text{Explanation (For Diet 2)} \end{array}$



• 🗐 Overview • 🗲 Comments

About Lesson



A. Afferents from stretch receptors feed into the pneumotaxic Centre to modulate breathing

B. The pneumotaxic Centre is located in the thalamus

C. The pons contains dorsal and ventral respiratory groups that receive input from chemoreceptors.

D. Voluntary control of breathing is mediated by cortical motor neurons directly innervating respiratory group neurons in the medulla, altering their activity

E. When expiratory neurons fire they inhibit the activity of inspiratory neurons

Involuntary respiration

Involuntary respiration is under subconscious control. The diaphragm and intercostal muscles are the primary respiratory muscles. They are stimulated by groups of neurons located in the pons and medulla. These neurons form the respiratory control centre. They send impulses to the primary respiratory muscles, via the phrenic and intercostal nerves, which stimulate their contraction. There are three main groups of neurons involved in respiration:

• The ventral respiratory group controls expiration



• The dorsal respiratory group controls inspiration

• The pontine respiratory group controls the rate and pattern of breathing.

Note: When expiratory neurons fire they inhibit the activity of inspiratory neurons and once the neurons stop firing, the inspiratory muscles relax, and expiration occurs.

Voluntary respiration

Voluntary respiration is under conscious control. It is controlled via the
motor cortex in the cerebrum, which receives inputs from the limbic
system and hypothalamus. Signals are thought to be sent to the spinal
cord from the motor cortex, which are then passed onto the respiratory
muscles.

<u>Central control of breathing (brainstem and cerebral cortex: High Yield)</u>

1. Medullary respiratory center (Recall)

A: Dorsal respiratory group is primarily responsible for inspiration and generates the basic rhythm for breathing

 Input to the dorsal respiratory group comes from the vagus and glossopharyngeal nerves. The vagus nerve relays information from peripheral chemoreceptors in the lung. The glossopharyngeal nerve relays information from peripheral chemoreceptors and Output from the dorsal respiratory group travels, via the phrenic nerve, to the diaphragm



<u>B: Ventral respiratory group</u> is primarily responsible for expiration, is not active during normal, quiet breathing, when expiration is passive.

- Activated during exercise, when expiration becomes an active process.
 - **2. Apneustic center** is located in the lower pons. Stimulates inspiration, producing a deep and prolonged inspiratory gasp (apneusis).
- <u>3. Pneumotaxic center</u> is located in the upper pons. inhibits inspiration and, therefore, regulates inspiratory volume and respiratory rate.
- **4.Cerebral cortex:** Breathing can be under voluntary control; therefore, a person can voluntarily hyper ventilate or hypo ventilate.

Note: Hypoventilation (breath-holding) is limited by the resulting increase in Pco2 and decrease in P02

2/15

An eight-year-old girl presents to the ED with impetigo around her mouth and nose.

What is the most likely method of spread?

A. Hematogenous spread

B. Invasion of breached skin



C. Via fecal oral route

D. Invasion of intact skin



E. Droplet spread

Impetigo is highly contagious skin infection caused by staph aureus

Note: Fusidic acid is used for staphylococcus skin infection (impetigo) Recall

Infection	Investigation
Stool: parasites	Direct light microscopy (Recall)
Sputum: TB	Ziehl-Nelsen stain
Blood: malaria	Giemsa stain (Recall)
Penetration through intact skin	Leptospira and Treponema
Penetration through breached skin	If skin integrity is broken e.g., by intravenous cannulation, blood-borne viruses such as hepatitis B, Hepatitis c and HIV can be transmitted.
	if the skin is punctured or broken, staph aureus can enter the wound and cause an infection.



Note: Malaria is blood borne pathogen(Recall) introduced via the bite of a vector

3 / 15

The mean was calculated for study with normal distribution. The values distribution around the mean are measured by?

- A. Variance
- B. Interquartal range
- C. Mode 💥
- D. Median
- E. Standard deviation

Standard error of the mean = standard deviation / square root (number of patients)

High Yield:

Mean or average: is the sum of a collection of numbers divided by the number of numbers in the collection

The mode is the value that appears most often in a set of data



The median is the number separating the higher half of a data sample, a population, or a probability distribution, from the lower half. The median of a finite list of numbers can be found by arranging all the observations from lowest value to highest value and picking the middle one

For example, a study looks at the number of attendances brittle asthmatics have at A&E's across the north of England each quarter. Each A&E submits the number of attendances as below:

1,3,4,5,5,5,**6**,7,7,9,12,14,17

Mean = 7.5

Mode = 5

Median = 6

4/15

You have not answered this question

In a randomised controlled trial, the following types of biases are reduced by randomisation:

A. Ascertainment bias

B. Selection bias

C. Recall bias

D. Publication bias

E. Bias in handling dropouts

Subjects are randomised in a randomised controlled trial to ensure that the groups are identical apart from the intervention. Randomisa tion means that each subject has a predetermined chance of being allocated to each group, but the group to be allocated cannot be predicted. This will minimise any selection bias.

Ascertainment bias occurs when the results of a trial are systematic ally distorted by knowledge of which intervention each participant i s receiving. This type of bias is minimised by blinding of researchers, clinicians, and patients. Bias caused by dropouts occur because cha racteristics of subjects who left the trial before completion may be d iverent from those who do not. This type of bias is minimised by app ropriate analysis (for example, intention to treat analysis, worst case scenario analysis).

Recall bias occurs when the subjects' recall of past events is distorted by subsequent events. This type of bias occurs mainly in retrospective studies (for example, case control studies Recall) rather than randomised controlled trials. Publication bias occurs during the dissemination of the results.



Whilst in your physiology lecture you ask medical students what is the physiological purpose of AV nodal delay?

A. Increase time for ventricular filling



- B. Ejection fraction time
- C. Parasympathetic activity decreases AV nodal delay
- D. Sympathetic activity causes increase in AV nodal delay
- E. Increase time for filling of atria
- Significance of AV nodal delay
- The cardiac impulse does not travel from the atria to the ventricles too rapidly.
- This delay allows time for the atria to empty their blood into the ventricles before ventricular contraction begins. This increases the efficiency of the pumping action of the heart.
- It is primarily the AV node and its adjacent fibers that delay this transmission into the ventricles.

6/15

Contact us



Baby defecate after eating due to which one of the following physiological reflex?

Δ.	Fr	ite	ro-	-00	lic	ref	lex





C. Oesophageo-colic reflex

D. Oesophageo-gastric reflex

E. Vagal reflex

The gastrocolic reflex is a physiological reflex that controls the motility of the lower gastrointestinal tract following a meal. As a result of the gastrocolic reflex, the colon has increased motility in response to the stretch of the stomach with the ingestion of food.

7/15

A 44-year-old woman presents with a two-month history of nausea, weight loss, and diarrhea. She returned from working in Nigeria five months ago. Do you suspect tapeworm infestation

What diagnostic method is most likely to confirm acute Infestation?

A. Colonoscopy

B. Eosinophil count



C. Abdominal CT

D. Serum antibodies

E. Visualization of eggs in stool on light microscopy



Stool: parasites

Direct light microscopy

Sputum: TB

Ziehl-Nelsen stain

8/15

A 19-year-old man presents with an open tibial fracture contaminated with soil. His immunizations are up to date.

With regard to tetanus prophylaxis what is the most appropriate management?

A. Administration of tetanus vaccination now and in one month

B. No further tetanus prophylaxis





C. Administration of tetanus immunoglobulin and vaccination



D. Administration of tetanus vaccination

E. Administration of tetanus immunoglobulin

Diphtheria, tetanus, polio vaccine schedule: 2, 3, 4 months, preschool and 14 years

Child's immunization status is up to date and his last vaccination schedule was in 14 years. Less than 10 years are passed

Up to date immunization status and last dose less than 10 years	No tetanus immunoglobin or vaccine
Up to date immunization status and last dose greater than 10 years ago	Clean wound: NO IG or vaccine High risk wound: Both IG and vaccine
No immunization or uncertain immunization or born before1961	Clean wound: Immediate reinforcing dose of vaccine High risk wound: Both immediate IG and vaccine



A 50-year-old male presents to ER with worsening breathlessness, on examination you find signs of heart failure. In heart failure, the frank starling curve is moved downward due to:

- A. Decrease in preload
- B. Decrease in contractility
- C. Increase in preload
- D. Increase in Afterload
- E. Decrease in Afterload

The ability of the heart to change its force of contraction and therefore stroke volume in response to changes in venous return is called the Frank-Starling mechanism.

The heart will contract with greater force when preload/EDV is increased. Preload is diastolic filling volume of left ventricle reflect stretch of cardiac muscle cells, greater the stretch more forcefully heart will contract. when there is increased EDV/ preload there is increased is Stroke volume this intrinsic relationship between EDV and stroke volume is known as frank starling law of heart...

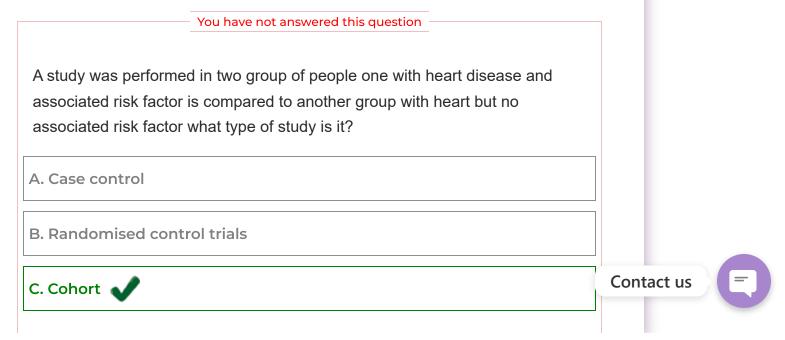


In HEART FAILURE, the Frank–Starling curve is moved down and flattened due to reduced inotropy, so that more venous return and hence preload is required to increase stroke volume. As venous return and preload rise, myocyte stretching occurs that increases sarcomere length.

FACTORS AFFECTING THE FRANK STARLING CURVE

- increase in contractility shift the curve **upward and to the left e.g.: positive inotropic drugs (RECALL)**
- Decrease in contractility= downward and to the right
- Increase in preload = rightward shift
- decrease in preload=leftward shift
- Increase in Afterload=Downward and right
- decrease in Afterload=upward and left

10 / 15



D. Cross Sectional

E. Interventional

Case control study:

- Retrospective longitudinal observational
- study Disease vs non-Disease
- Subject to recall bias
- Related to ODD Ratio

Cohort Study:

- Forward Study or Prospective longitudinal observational study
- Group with Risk Factors and Group without Risk Factors
- Related to Relative Risk
- Cause to Effect

Cross-sectional:

- Cross-sectional observational study
- Disease and Risk Factors
- Subject to recall bias

11 / 15

A woman sustained a human bite from someone known to have hepatitis B two hours ago. She has not had any previous hepatitis B vaccinations



Regarding prophylaxis against hepatitis B, what is the most appropriate schedule to follow?

- A. Hepatitis B Immunoglobulin immediately
- B. Hepatitis B vaccine three doses over three months
- C. Hepatitis B Immunoglobulin immediately and Hepatitis B vaccine three doses over three months
- D. Hepatitis B Immunoglobulin immediately and Hepatitis 8 vaccine three doses over six months
- E. Hepatitis B vaccine three doses over six months

Emergency hepatitis B vaccination

If you have been exposed to the hepatitis B virus and have not been vaccinated before, you should get immediate medical advice, as you may benefit from having the hepatitis B vaccine.

In some situations, you may also need to have an injection of antibodies, called specific hepatitis B immunoglobulin (HBIG), along with the hepatitis B vaccine.

HBIG should ideally be given within 48 hours post exposure Hepatitis B vaccine three doses over three months



A 72-year-old woman presents to the ED with a 24-hour history of blistering rash on the left side of her forehead. You suspect varicella zoster virus infection (shingles). What is the most appropriate way to make the diagnosis prior to starting treatment?

A. Clinical history and examination alone



- B. IgM ELISA serology from blood sample
- C. Direct fluorescent antibody staining from skin scraping sample
- D. Polymerase chain reaction from skin scraping sample
- E. IgG ELISA serology from blood sample

Varicella zoster virus causes:

- Chicken pox
- Shingles usually affects older

Varicella zoster Key Points

- The incubation period is 10 21 days (Recall) (mean time is 14 days).
- Primary infection typically occurs in 4-10 years children
- Diagnosis is usually clinical



 After primary infection virus lies dormant in posterior root ganglion and reactivates in 20% of patients causing shingles

• School exclusion period: when all lesions are crusted over (Recall

13 / 15

Regarding the power of study which one of the following statements is correct?

A. Power increases with sample size



B. Power decreases with sample size

C. Power does not change with sample size

D. Power increases as the variability increases



E. Power decreases as the variability decrease

The power of a study is the probability of (correctly) rejecting the null hypothesis when it is false, i.e. the probability of detecting a statistically significant difference

- power can be increased by increasing the sample size
- Power increases as the variability decrease

Note: Increasing sample size can decrease bias /error. (Recall)



A 30-year-old man presents with symmetrical ascending muscle weakness. He had a diarrheal illness a few weeks previously

What is the most likely pathogen?

A. Campylobacter jejuni



B. Borrelia burgdorferi

C. Epstein-Barr virus

D. Clostridium difficle

E. Cytomegalovirus

GBS cases seem to occur after a viral or bacterial infection like those that cause sore throats or diarrhea characterized by lower limb weakness, paresthesia and hyporeflexia

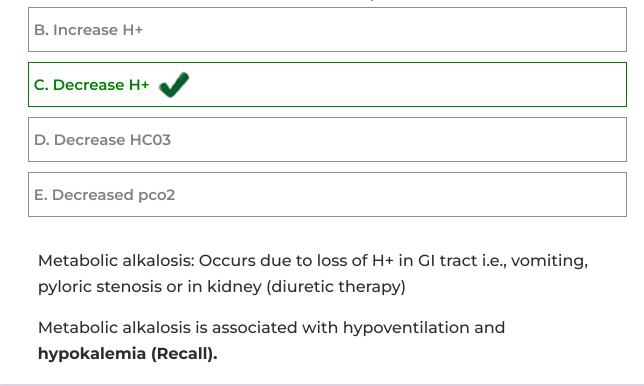
15 / 15

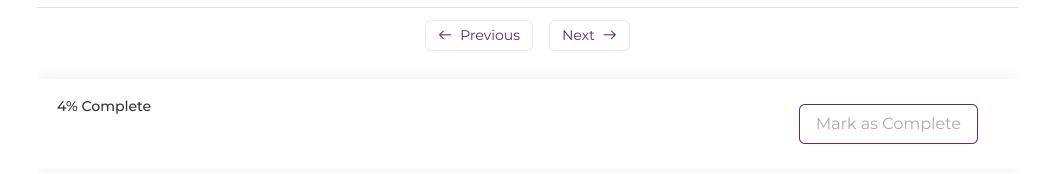
An 8-year-old child brought into the ED with a complaint of severe vomiting. ABGs revealed metabolic alkalosis. Metabolic alkalosis occurs after vomiting due to?

Contact us



A. Increased pco2





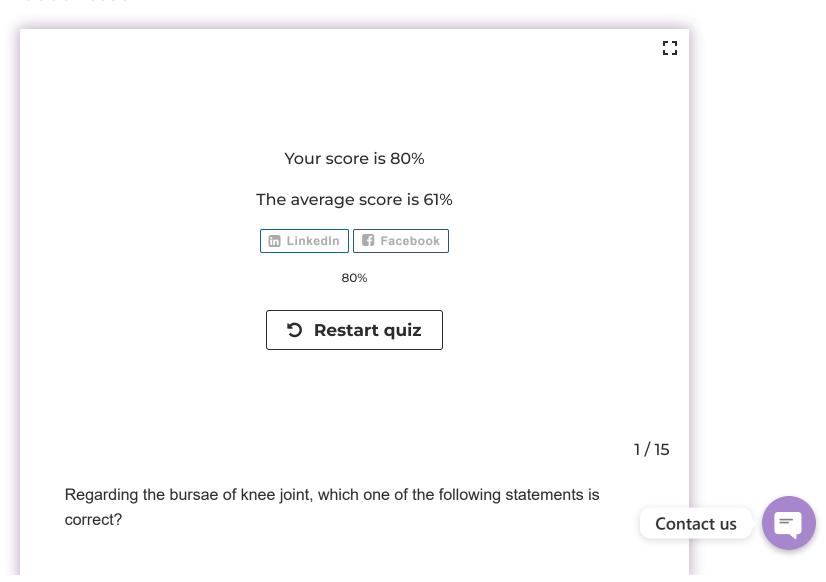
← Mrcem Primary Complete Course ,High Yield Stuff and Similar to Previous Exam Questions With Explanation (For Diet 2)



• Overview •

E Comments

About Lesson



- A. Suprapatellar bursa located in the sartorius
- B. Housemaid knee is due to inflammation of infrapatellar bursa
- C. Suprapatellar bursa located between the quadriceps femoris and the femur
- D. Prepatellar bursa located in the sartorius
- E. Prepatellar bursa found between the quadriceps femoris and the femur

Bursa: synovial fluid filled sac within joints provide low friction surfaces for the movement of tendons associated with joint

- Suprapatellar bursa located between the quadriceps femoris and the femur (Recall)
- Prepatellar bursa found between the apex of the patella and the skin.

 Housemaid knee is due to inflammation of Prepatellar bursa
- Infrapatellar bursa: split into deep and superficial. The deep bursa lies between the tibia and the patella ligament. The superficial lies between the patella ligament and the skin. Clergyman's Knee is due to inflammation of infrapatellar bursa.

2/15

18 weeks Pregnant lady previously non-immune comes in contact with a chickenpox patient. Which one of the following management plans is correct?





A. Immunoglobulin+ iv acyclovir for 7 days



B. Immunoglobulin+ iv acyclovir for 14 days



C. Treat with IV antibiotics

D. Immunoglobulin and vaccine

E. Vaccine and IV acyclovir

Chickenpox in pregnancy is managed by two different methods - one is used before the onset of symptoms and the other after the onset of rash. One is varicella-zoster immune globulin (VZIG), which strengthens the immune system for a short time. If you are not immune to chickenpox you can be treated with VZIG, usually by injection, up to ten days after you come into contact with chickenpox. It is used before any symptoms appear; it does not work afterwards. The other is Acyclovir, which may reduce fever and symptoms if it is started within 24 hours of the rash developing and continue for 7 days

Key points:

If you have already had chickenpox, you have nothing to worry about.

Once you have had chickenpox you cannot catch it a second time, this is known as being immune.



Nine out of ten UK adults are immune to chickenpox.

Chickenpox is very rare in pregnant women in the UK.

It affects very few babies in the womb and although it can be very serious in pregnancy especially in 1st trimester in first 12 weeks (Recall)

If you have been in contact with chickenpox and are not sure if you are immune, contact your GP or midwife not attend the antenatal clinic.

If you have chickenpox, avoid contact with other pregnant women and new babies until at least five days after the rash appears, or until all the blisters have crusted over.

3 / 15

A 2-year-old child brought into the ED by his parents with a history of fever associated with harsh cough, runny nose and hoarse of the voice for the last two days. On examination the child has mild tachycardia, tachypnoea and his SpO2 is 98%. Which of the following is the most likely infectious cause of his condition?

A. Glandular fever

B. Hemophilus influenzae type B



C. Strep group A

D. Parainfluenza



QUIZ: 19 | MRCEM EXPERT E. RSV

Bordetella Pertussis	Gram negative Cocco bacilli causing whopping cough characterized by severe coughing from more than 2 weeks, nasal congestion, red eyes and post tussive vomiting Diagnosis: • If the cough is of 2 weeks' duration or less: culture of nasopharyngeal swab in all ages • If the cough is of less than 3 weeks PCR testing of nasopharyngeal swabs can also be used to confirm in all ages • If the cough is of more than 2 weeks' duration, anti-pertussis toxin immunoglobulin G (IgG) serology may be employed in people aged over 17 • If the cough is of more than 2 weeks' duration, Anti-pertussis toxin IgG detection in oral fluid can be used in children aged 5 to 16 years. (Recall) RX: 1st line antibiotic: Macrolide (erythromycin) Recall
Parainfluenza	
virus	harsh barking cough, runny nose and
	hoarseness of the voice

A 71-year-old man with a history of heart failure and type 2 diabetes mellitus presents with an acutely painful, swollen first metatarsophalangeal joint. A clinical diagnosis of gout is made. Which treatment would be most appropriate for the acute management of this Patient?

Α.	Al	0	р	u	r	i	r	ì	0	I

B. Diclofenac

C. Prednisolone

D. Febuxostat

E. Colchicine

Management of gout

Acute gout: NSAIDS (specially naproxen) Recall

Gout with heart failure: Colchicine

Chronic gout: Allopurinol also reduces further attacks of gout by reducing uric acid

Note: In gout under polarized light, gout crystals appear needleshaped and yellow, a property called **negative birefringence (Recall)**



• Gout crystals are monosodium urate crystals

In Pseudo gout: Positive birefringence and pyrophosphate crystals (Recall).

5 / 15

Regarding preventive measures and spread of infection of thread worm, which one of the following statements is correct?

- A. Treat everyone in your home if they have symptoms only
- B. Do not treat other family members
- C. Treat infected persons with mebendazole who have symptoms
- D. Treat everyone in your home even if they do not have symptoms



E. Treat only infected persons with mebendazole

Thread worm is the most common helminth in the UK, commonly infect children

Mebendazole is the drug of choice and you must treat everyone in your home even if they do not have symptoms.



A 32-year-old male with history of trauma to the hand presents with pain in the right hand associated with tingling and numbness. You suspect median nerve injury. Which one of the following is the most lateral structure forming the carpal arch?

A. Trapezium
B. Ulnar nerve
D. Olliar Herve
C. Pisiform
D. Median nerve
E. Hook of hamate

Carpal tunnel structures



Roof	Flexor retinaculum
Carpal arch	Medially: Pisiform and hook of the hamate Laterally: tubercles of the scaphoid and trapezium
Contents	 Four tendons of flexor digitorum profundus (FDP) Four tendons of flexor digitorum superficialis (FDS): Most superficial structure (Recall) Tendon of flexor pollicis longus (FPL): Lateral structure (Recall) median nerve laterally

A 25-year-old woman presents with shortness of breath and right-sided chest pain. You suspect pulmonary embolism.

Which parameter is most likely to be decreased?

A. Po2 in pulmonary venous blood



B. Left atrial pressure

C. Right atrial pressure

D. Ventilation to perfusion ratio

E. Pulmonary vascular resistance



In PE, pulmonary vascular resistance (PVR) increases due to the mechanical obstruction of the vascular bed with thrombus and hypoxic vasoconstriction. Pulmonary artery pressure (PAP) increases if thromboemboli occludes greater than 30% to 50% of the total cross-sectional area of the pulmonary arterial bed.

• Increased PVR increases the right ventricular afterload, which impedes right ventricular outflow, which, in turn, causes right ventricular dilation and flattening or bowing of the interventricular septum. The desynchronization of the ventricles may be increased by the development of the right bundle branch block. The decreased RV outflow and concomitant RV dilation reduce left ventricular filling, thereby compromising cardiac output. As a result, LV filling is reduced in early diastole, and this leads to a reduction in the cardiac output (CO) and cause systemic hypotension and hemodynamic instability. Low cardiac output leads to increased extraction of oxygen in the tissues, thereby decreasing the partial pressure of oxygen in venous blood below normal level. Right ventricle (RV) failure due to acute pressure overload is the primary cause of death in severe PE.

Note: Due to increase after load in right ventricle right ventricular dilation and right atrial pressure increases in pulmonary embolism (Recall)

• Pulmonary embolism: Increase physiological dead space (Recall).

8/15

Regarding prophylaxis of malaria which one of the following antibiotics is used?



A. Rifampicin

B. Clindamycin

C. Doxycycline

D. Clarithromycin

E. Vancomycin

Doxycycline is used as prophylaxis for malaria who travel to countries with extensive resistance to Chloroquine.

9/15

Repeated stimulation of a skeletal muscle fiber causes a sustained contraction (tetanus). Accumulation of which solute in intracellular fluid is responsible for the tetanus?

A. Potassium

B. Calmodulin

C. Troponin

D. Calcium 🎻



E. Sodium

During repeated stimulation of a muscle fiber, Calcium is released from the sarcoplasmic reticulum (SR) more quickly than it can be reaccumulated; therefore, the intracellular [Ca2+] does not return to resting levels as it would after a single twitch. The increased [Ca2+] allows more cross-bridges to form and, therefore, produces increased tension (tetanus)

Note: In skeletal muscle, Ca² binds to troponin C (Recall) initiating the cross-bridge cycle. In smooth muscle, Ca²+ binds to calmodulin.

High Yield:

Muscle filaments:

Thick filaments: Present in the A band in the center of the sarcomere

• Contains Myosin (Recall)

Thin filaments: Present in the I bands

- Anchored at the Z lines
- Contains actin, tropomyosin and troponin

10 / 15

A 16-year-old young male brought into the ED with complaint of dizziness, fatigue and edema on his face and feet. After initial assessment you suspect Nephrotic syndrome, regarding nephrotic syndrome what is the cause of edema?



A. Hyperalbuminemia B. Hypoalbuminemia 🕡 C. Decreased extravascular oncotic pressure D. Increased salt excretion E. Increased intravascular oncotic pressure Nephrotic syndrome leads to urinary loss of albumin (Hypoalbuminemia) which reduces intravascular oncotic pressure and fluid shift to extracellular compartment. 11 / 15 A 20-year-old male presents to the ED with complaint of pain in his right foot after falling from upstairs. Which one of the following ankle ligaments is torn during eversion injury? A. Posterior talofibular B. Calcaneofibular ligament C. Medial deltoid ligament Contact us D. Lateral collateral ligament

E. Anterior talofibular

Ankle ligaments

<u>Eversion injury</u> = medial deltoid ligament injury

inversion injury = Lateral collateral ligament injured (subdivided into 3 ligaments) most frequent ligament injury during ankle sprain or inversion injury commonly affected ligament is Anterior talofibular ligament (Recall) followed by calcaneofibular ligament (both are ligaments of lateral collateral ligament)

Least injured during inversion injury post talofibular ligament.

12 / 15

A 35-year-old woman presents with fatigue and yellow sclera. Blood tests reveal a high bilirubin which is found to be unconjugated bilirubin. What pathology is the most likely cause for her jaundice?

A. Hepatocellular carcinoma

B. Carcinoma of the head of the pancreas



C. Sickle cell disease





D. Hepatitis

E. Gallstone in the bile duct

Causes of conjugated hyperbilirubinemia	Causes of unconjugated hyperbilirubinemia
 Intrahepatic causes: Viral hepatitis, Alcoholic hepatitis, Primary biliary cirrhosis Hepatocellular carcinoma Extrahepatic causes: Choledocholithiasis Cholangitis Cholangiocarcinoma Chronic pancreatitis and pancreatic adenocarcinoma 	 Sickle cell anemia Thalassemia Gilberte syndrome Crigler- Najjar syndrome Glucose 6 phosphate dehydrogenase deficiency

13 / 15

A mother brought her 3-year-old child into ED with complaint of runny nose, severe coughing from the last 2 weeks and developed subconjunctival hemorrhage. What is the most likely causative agent?

A. Strep group A

B. Parainfluenza virus



C. Hemophilus influenzae type B

D. Bordetella Pertussis 🕡

E. RSV

Bordetella Gram negative Cocco bacilli causing Pertussis whopping cough characterized by severe coughing from more than 2 weeks, nasal congestion, red eyes and post tussive vomiting Diagnosis: If the cough is of 2 weeks' duration or less: culture of nasopharyngeal swab in all ages (Recall) • If the cough is of less than 3 weeks PCR testing of nasopharyngeal swabs can also be used to confirm in all ages If the cough is of more than 2 weeks' duration, anti-pertussis toxin immunoglobulin G (lgG) serology may be employed in people aged over 17 (Recall) If the cough is of more than 2 weeks' duration, Anti-pertussis toxin IgG detection in oral fluid can be used in children aged 5 to 16 years. (Recall) Parainfluenza Causing Croup characterized by harsh barking cough, runny nose and virus hoarseness of the voice



Note: Hemophilus influenza is also gram-negative Cocco bacilli (Recall)

14 / 15

A 25-year-old man attends ED after injury to his Right knee while skiing. He has a valgus deformity of knee. Which ligament is most likely to be damaged?

- A. Patellar ligament
- B. Posterior cruciate
- C. Lateral collateral
- D. Anterior cruciate
- E. Medial collateral

Valgus deformity: Also known as Knock-Kneed

- More stress on lateral compartment
- Ligament damaged is Medial collateral

Varus deformity: Also known as bow legged

- More stress on medial compartment
- Ligament damaged is lateral collateral



Note: lateral collateral ligament inserts on the head of fibula where it joins with bicep femoris tendon (Recall) to form conjoint tendon.

15 / 15

A 55-year-old male known case of COPD came with a complaint of breathlessness. His observations include BP=100/70 Pulse=102bpm and Sa02 is 78%. You keep the patient on 02, what is the targeted 02 saturation prior to discharge?

A. 80-84%

B. Unless SaO2 becomes 94%

C. Unless SaO2 becomes 100%

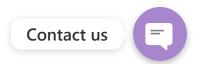
D. Unless SaO2 becomes 98%

E. 88 – 92%

COPD and conditions associated with chronic respiratory failure. In the treatment of exacerbations of chronic obstructive pulmonary disease (COPD), oxygen should be titrated to achieve a target oxygen saturation range of **88–92%**.

4% Complete

Mark as Complete



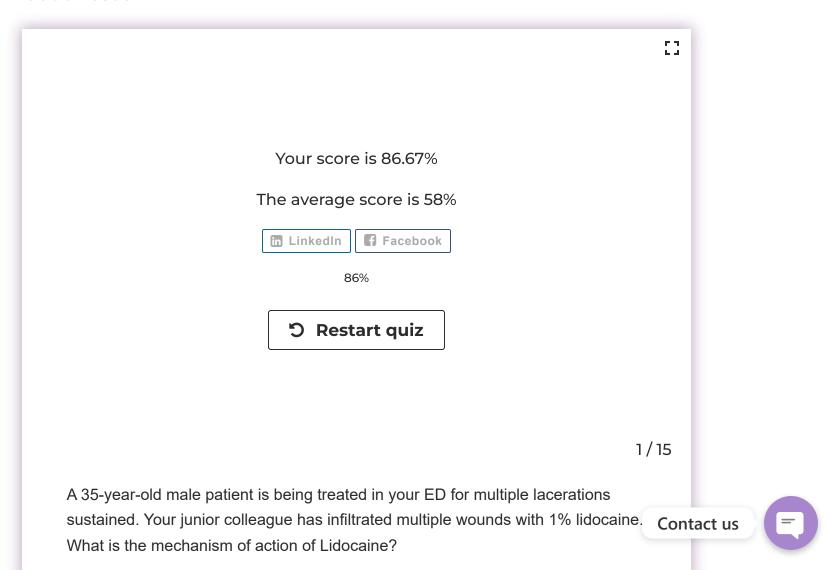
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Overview •

Comments

About Lesson



A. Activation of Na+ Channel

B. Na+ Channel blocker

C. Calcium channel blocker

D. Activation of K+ Channel

E. Activation of Ca+ Channel

 Local anesthetics reversibly inhibit nerve transmission by binding voltage-gated sodium channels

Lidocaine (Na channel blocker) Recall	Prilocaine	Bupivacaine
Most widely used local anesthetic	Used for IV regional anesthesia (Bier block) Recall	 Local anesthetic with longest duration of action (Recall) Used in Lumbar epidural block

2/15

A 32-year-old pregnant female presented to the ED with severe vomiting. Initial fluid resuscitation and antiemetic drug metoclopramide was given. In a short period of time, she has developed extrapyramidal symptoms. Which of the following is the drug of choice in her condition?





A. Benztropine



C. Haloperidol with promethazine

D. Diazepam

E. Midazolam

Metoclopramide is dopamine receptor antagonist (Recall), commonly associated with extrapyramidal symptoms induce acute dystonic reactions causing fascial and skeletal muscle spasm

Antidote: Injection of anti-parkinsonism drug Such as "Procyclidine will abort dystonic attack.

Note: Extrapyramidal symptoms are most commonly associated with antiemetics and antipsychotics.



Drug toxicity	<u>Antidote</u>
Lidocaine	Intralipid emulsion
Prilocaine	Methylene blue
Tricyclic antidepressants	Sodium bicarbonate
Metoclopramide	Procyclidine
Benzodiazepines	Flumazenil
Opioid	Naloxone
Organophosphate Poisoning	Atropine
Paracetamol poisoning	N-acetyl cysteine
Hyperkalemia	Ca gluconate

3/15

A 22-year-old male presents with palpitations. ECG was done at triage which shows S.V.T. You are considering adenosine, in which of the following conditions adenosine is contraindicated?

A. Peripheral vascular disease



B. Myasthenia gravis

C. Blood dyscariasis

D. Asthma

E. Diabetes mellitus

Adenosine is treatment of choice in terminating supraventricular tachycardia

Contraindications of adenosine include:

- Asthma and COPD
- Decompensated heart failure
- Long QT syndrome
- Second- and third-degree heart block
- Severe hypotension

4/15

You are required to perform procedural sedation on a patient who requires a neuromuscular blocking agent. What is the contraindication of Suxamethonium?

A. Renal impairment

B. Hypotension



C. Hypokalemia

D. Hyponatremia

E. Hyperkalemia 🕡



Neuromuscular blocking agents

Non-depolarizing neuromuscular blocking agents	Depolarizing neuromuscular blocking agents
Mechanism: Bind with Ach receptors on neuromuscular junction blocking action of acetylcholine and prevent depolarization	 Suxamethonium A depolarizing neuromuscular blocking agent, succinylcholine adheres to post-synaptic cholinergic receptors of the motor endplate, inducing continuous disruption that results in transient fasciculations or involuntary muscle contractions and subsequent skeletal muscle paralysis
Antidote: Neostigmine reverse the effects of non-depolarization drugs	 <u>Contraindications:</u> Hyperkalemia, Risk of developing hyperkalemia (Burn injury (Recall), Muscular dystrophy and crush injury).



5/15

A 25 Years old male presents to the ED with complaint of fever, photophobia and neck stiffness. You suspect meningitis. Which tactic is used by Neisseria meningitidis to evade host defense?

- A. Express protein A
- B. Secretes an IgA1 protease
- C. Polysaccharide capsule which inhibits phagocytosis by neutrophils
- D. Produces exotoxin
- E. Using motile flagellum,

Tactics of bacteria to evade host defense

Neisseria meningitidis	Secretes an IgA1 protease.
Staphylococcus aureus	Staph aureus avoids opsonophagocytic by expressing on its surface a capsule, clumping factor A, protein A
Streptococcus pneumonīae	Has a polysaccharide capsule which inhibits phagocytosis by neutrophils

6/15

A 5-year-old school-going child gets exposed to measles. What should parents be advised about returning to school?

- A. 5 days from onset of rash
- B. After 24 hours of fever
- C. When all lesions are crusted over
- D. 4 days from onset of rash



E. 6 days after rash has gone

Patients are considered infectious for 3 days before the rash emerges and are advised to stay away from school or for four days from onset of



the rash.

Note: Regarding rubella: Patients are infectious from 7 days before the rash appears and until 4 days after the rash appears (Recall)

7 / 15

You are required to perform procedural sedation in a patient who requires propofol. What is the mechanism of action of propofol?

- A. Na channel blocker
- B. GABA receptor inactivation
- C. GABA receptor activation
- D. NMDA receptor agonist
- E. NMDA receptor antagonist



<u>Ketamine</u>	<u>Propofol</u>
> NMDA receptor antagonist	> GABA receptor activation
Ketamine increases sympathetic drive increases Blood pressure and heart rate.	Used for both induction and maintenance of anesthesia
Best given in haemodynamically unstable patients and asthma	Decreases sympathetic drive decreases Blood pressure and heart rate

8/15

You are required to perform procedural sedation in a patient who require ketamine for the hip fracture. Ketamine primarily acts on what receptor?

A. Mu-opioid receptor

B. GABA receptor

C. Nicotinic receptor

D. NMDA receptor



E. Muscarinic receptor



Uses: **Ketamine increases sympathetic drive increases Blood pressure and heart rate** so considered in hemodynamically unstable patient

• Ketamine has minimal effect on respiratory drive that's why can be used for induction in Asthma (Recall)

Contraindications: Head trauma, Stroke, Hypertension

9 / 15

A 33-year-old man presented to the ED with 2 hours history of Palpitations ECG was done and it Shows SVT. He has no past medical history and denies any chest pain and breathlessness. His observations are recorded pulse 270bpm R.R 20 GCS 15/15. What is your 1st line treatment in this?

A. IV Amiodarone

B. DC cardioversion

C. IV adenosine

D. Valsalva maneuver

E. IV fluids

 Any tachyarrhythmia presenting with adverse features should be treated with DC shock



	Narrow complex tachycardia	Broad complex tachycardia
•	Regular narrow complex: SVT Treatment: Initial vagal/ Valsalva maneuver.	Ventricular tachycardia: Amiodarone 300mg
	A - Jah A A	Trosades-de-pointes: Magnesium Trosades-de-pointes: Magnesium
•	And then treat with Adenosine 6mg, followed by 12 and 18mg	sulfate 2mg (Recall)
		All the enzyme inhibitor drugs prolong
	Irregular narrow complex: Atrial fibrillation (follow AF protocol)	QT interval and induce Trosa-des- pointes

10 / 15

A 77-year-old nursing home resident is brought into the ED pyrexial with shortness of breath and purulent sputum. She is diagnosed with pneumonia.

Which pathogen is most in keeping with an endogenous infection source?

A. Mycoplasma pneumonia

B. Pseudomonas aeruginosa



C. Pneumocystis Jiroveci

D. Legionella pneumophila



E. Chlamydophila psittaci

Pseudomonas aeruginosa	Gram negative rod causes Nosocomial or hospital acquired or nursing home infection (mainly pneumonia, UTI and wound infection)
Legionella pneumophila	Reservoir: air-conditioning units High risk factors include older people, alcoholic and immunosuppression Causing pneumonia Note: Hyponatremia is important laboratory finding occurs more common in Legionella pneumophila (Recall)

11 / 15

A 55-Year-old male presents to the ED with minor bleeding from nose. He is currently on warfarin for atrial fibrillation, which one of the following drugs is best given to reverse adverse effects?

A. Phytomenadione IV



B. Idaracizumab

C. Fresh frozen plasma



D. Protamine sulfate



E. Cyproheptadine

- If INR> 8 and no bleeding = Phytomenadione orally
- If INR> 8 and minor bleeding = Phytomenadione Iv
- If INR> 8 and major bleeding = Phytomenadione Iv and dried prothrombin complex (Recall)
- If INR 5-8 and no bleeding = Withhold warfarin
- If INR 5-8 and minor bleeding = Phytomenadione Iv

12 / 15

A 25-year-old woman presents with clinical features of anaphylaxis. You consider administering intramuscular adrenaline. Which strength of adrenaline is most appropriate in this situation?

A. 1:100

B. 1:100,000

C. 1:10

D. 1:10,000

E. 1:1000 🍑

Adrenaline dose in anaphylaxis: 0.5 mg/ 0.5 ml of 1:1000 adrenaline



Adrenaline dose in cardiac arrest during CPR: 1mg of 1: 10000 concentration (Recall).

13 / 15

A 26-year-old woman attends complaining of lower abdominal pain. She has a positive pregnancy test despite taking the contraceptive pill. She has epilepsy and has recently had her medication changed. Which antiepileptic is most likely to have had an effect on her oral contraceptive?

- A. Levetiracetam
- B. Carbamazepine
- C. Sodium valproate
- D. Lamotrigine
- E. Clobazam



Enzyme inducers	Enzyme inhibitors
 Increasing the rate of metabolism and hepatic clearance of concurrently administered drugs, which typically results in a decreased pharmacologic effect. 	Decrease hepatic clearance and increase pharmacologic effect.
Useful mnemonic SCRAP GP Sulphonylureas Carbamazepine Rifampicin Alcohol Phenytoin (Recall) Griseofulvin Phenobarbital	Useful mnemonic: SICKFACES.COM Sodium valproate Isoniazid Cimetidine Ketoconazole Fluconazole Alcohol Chloramphenicol Erythromycin Sulfonamides Ciprofloxacin Omeprazole Metronidazole

Note: In pregnancy on contraceptive pills, enzyme inducer drugs will increase hepatic clearance of contraceptive pills and pregnancy can still happen

Enzyme inhibitors raise plasma theophylline levels

Enzyme inducers decrease plasma theophylline level

14 / 15

Contact us



A 40-Year-old male who is known hypertensive taking ACE inhibitors presents with dry cough. What is the mechanism of cough in ACE inhibitor?

A. Decreased bradykinin breakdown



- B. Histamine release
- C. Stimulation of irritant receptors
- D. Increased bradykinin breakdown
- E. Increased production of prostaglandin

ACE inhibitor decreases the breakdown of the potent vasodilator bradykinin which is the cause of the persistent dry cough.

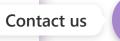
Side effects of ACE inhibitor includes:

- Acute kidney injury
- Hyperkalemia
- Non allergic angioedema (Recall)
- Persistent dry cough (Recall).

15 / 15

A 40-year-old woman presents to the ED with palpitations. She has no other symptoms. She has been prescribed fluoxetine for psychiatric disorder and recently completed a Course of erythromycin for chest infection.

What is the most likely diagnosis?



A. VF

B. AF

C. Polymorphic VT

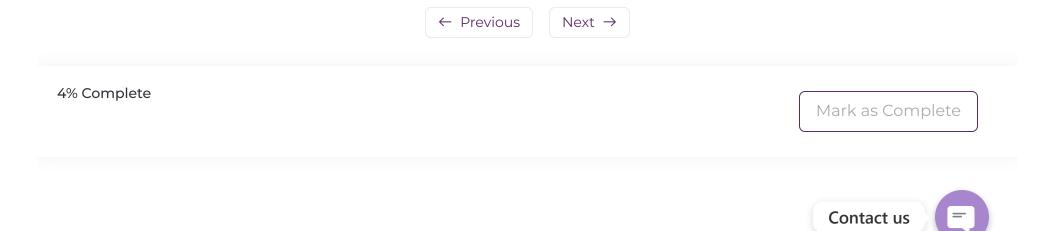
D. Torsade de pointes

E. Third degree AV block

• All the enzyme inhibitor drugs prolong QT interval and induce Torsade de pointes.



Enzyme inducers	Enzyme inhibitors
 Increasing the rate of metabolism and hepatic clearance of concurrently administered drugs, which typically results in a decreased pharmacologic effect. 	Decrease hepatic clearance and increase pharmacologic effect.
Useful mnemonic SCRAP GP Sulphonylureas Carbamazepine Rifampicin Alcohol Phenytoin (Recall) Griseofulvin Phenobarbital	Useful mnemonic: SICKFACES.COM Sodium valproate Isoniazid Cimetidine Ketoconazole Fluconazole Alcohol Chloramphenicol Erythromycin Sulfonamides Ciprofloxacin Omeprazole Metronidazole



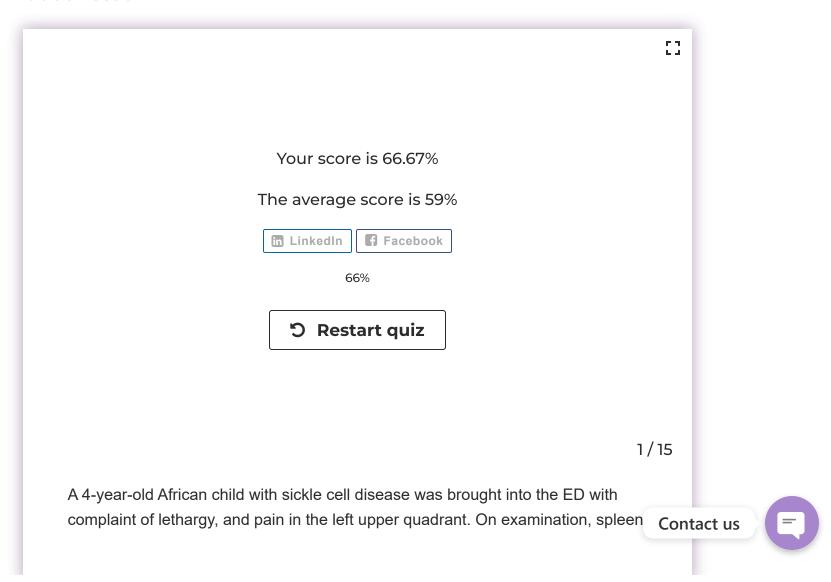
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Overview •

E Comments

About Lesson



is enlarged. Lab findings revealed anemia and reticulocytosis. What is the most likely complication child has developed?

A. Vasoo active crises

B. Aplastic crises **X**



C. Cholecystitis

D. Pulmonary hypertension

E. RBC sequestration



Acute Splenic Sequestration

- Sudden trapping of RBC within the spleen
- Usually occurs in infants under 2 years of age
- Spleen enlarged on physical exam Circulatory collapse and death can occur

2/15

A 55-year-old man with hypertension is prescribed an antiarrhythmic agent that alters the flow of cations in myocardial tissue. The image is a trace of a myocardial action potential. Each phase is associated with the opening and/ or closing of various ion channels. Which of the following would be affected by an agent that affects phase 1 of the myocardial action potential?



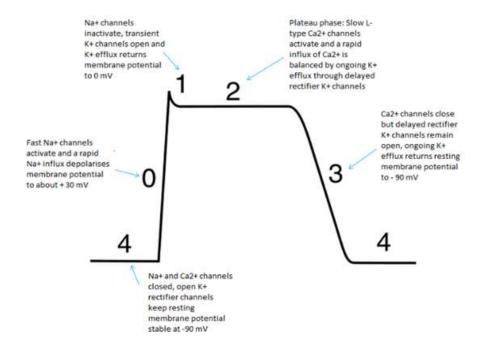
- A. Ligand-gated Ca2+ channels opening
- B. Ligand-gated Na+ channels opening
- C. Voltage-gated Na+ channels closing



D. Voltage-gated Na+ channels opening

E. Voltage-gated Ca2+ channels opening





3 / 15

Which one of the following myocardial cell structures is responsible for the conduction of action potential in cardiac cells?

- A. Sarcomere
- B. T-tubules
- C. Sarcoplasmic reticulum
- D. Intercalated disc
- E. Gap junctions
- Gap Junctions: Allow for rapid electrical spread of action potential
- T-tubules: Carry action potential into the cell interior

4/15

An 87-year-old woman from a residential home with a 2-day history of diarrhea. She has had 10 episodes of watery diarrhea but no vomiting. She complains of colicky lower abdominal pain. She had a 5-day course of antibiotics for a chest infection 2 weeks ago. After initial assessment diagnosis of clostridium colitis was made. Which of the following is the best way to prevent spread by C.difficle to others?



A. Wash hand with soap and water



- B. Wash hand with sterile water
- C. Wash hand with alcohol gel
- D. Antibiotic treatment
- E. Wash hand with sanitizer

Clostridium difficile	Gram +Ve anerobic
	bacterium transmitted
	by fecal-oral route
	 Alcohol gel is not
	effective against
	spores of
	Clostridium difficile
	 Use soap and
	water

Which viral encephalitis causes Hemorrhagic necrosis of temporal lobes?

5/15 Contact us

A. Enterovirus
B. Herpes Simplex
C. Varicella
D. Rabies
E. EBV

The characteristic feature of Herpes simplex encephalitis is hemorrhagic necrosis of the temporal lobe. Infection tends to begin unilaterally, only spreading to the contralateral temporal lobe in the late stages of the disease.

6/15

A 39-year-old female patient is brought into ED following an explosion after rescuing her dog from a house fire. She has full-thickness burn all over the trunk. In burn patient's distributive shock occurs due to which mechanism?

A. Increased interstitial fluid

B. Increase extra cellular fluid osmolarity

C. Decreased interstitial fluid



D. Decrease intracellular fluid osmolality

E. Increase in intracellular fluid

• Burns initially cause capillary leakage resulting in severe hypovolemia and massive edema (increased interstitial fluid)

7 / 15

You are teaching group of nursing students flow of fluids through an iv cannula. You ask students if we double the radius of cannula, how will it affect rate of flow through cannula?

- A. Decrease 16-fold
- B. Increase 8-fold
- C. Decreases 4 times
- D. Increase 16-fold
- E. Increased 4-fold

Flow rate is directly proportional to radius 4 (r4)

• Tubing diameter: An important and frequently cited relationship is the Contact us of the tubing's radius. Doubling the radius of a catheter increases the



flow rate by 16-fold (r4). The larger the IV catheter the greater the flow.

8 / 15

A 20-week pregnant lady presents to the ED with exposure to chicken pox. What is your next step in management?

- A. Attend to antenatal clinic
- B. Check her antibody status
- C. Immediate reinforcing of immunoglobulin
- D. No action required
- E. Immediate reinforcing of vaccine

Key Points:

- If you have already had chickenpox, you have nothing to worry about.
- Once you have had chickenpox you cannot catch it a second time, this is known as being immune.
- Nine out of ten UK adults are immune to chickenpox.
- Chickenpox is very rare in pregnant women in the UK.
- It affects very few babies in the womb and although it can be very serious in pregnancy especially in 1 trimester in first 12 weeks (Recall)



- If you have been in contact with chickenpox and are not sure if you are immune, contact your GP or midwife and not to attend the antenatal clinic.
- If you have chickenpox, avoid contact with other pregnant women and new babies until at least five days after the rash appears, or until all the blisters have crusted over.

Whilst performing venipuncture you apply torniquet and ask medical students what is the cause of reactive hyperemia after torniquet removal?

A. Adrenaline

B. Increased PaO2



C. Inflammation

D. Vasoconstriction

E. Adenosine

• Reactive hyperemia is the transient increase in organ blood flow. Reactive hyperemia occurs following the removal of a tourniquet, unclamping an artery during surgery, the hyperemia occurs because during the period of occlusion, tissue hypoxia and a buildup of vasodilator metabolites (e.g., adenosine) dilate arterioles and decrease Contact us vascular resistance. Then when perfusion pressure is restored (i.e.,



occlusion released), flow becomes elevated because of the reduced vascular resistance. During the hyperemia, the tissue becomes reoxygenated and vasodilator metabolites are washed out of the tissue.

10 / 15

A 30-year-old female presented to the ED with Complain of Palpitations, tremors, and restlessness, her observations include a temperature is 39 °C, irregular pulse, and blood pressure 155/85 mmHg She has a history of hyperthyroidism but is uncompliant with treatment.

What is the best initial management plan?

A. Propylthiouracil

B. Propanolol

C. Carbimazole

D. Lugol iodine

E. Verapamil

- Treatment of thyroid storm consists of supportive measures like intravenous (IV) fluids, oxygen, cooling blankets, and acetaminophen, as well as specific measures to treat hyperthyroidism.
- After initial supportive measures, a beta-blocker e.g. propranolol shoul be started for any case of suspected thyroid storm.



Regarding the DVLA guidelines of diabetes, which one of the following statements is true?

A. Drivers whose diabetes is treated with insulin do not drive with a blood glucose less than 5mmol/l

B. Drivers whose diabetes is treated with insulin can drive safely without notifying DVLA

C. Drivers whose diabetes is treated with insulin do not drive with a blood glucose less than 10mmol/l

D. People who are on temporary insulin treatment should stop driving

E. Patient on oral hypoglycemic agents must not drive

Precautions advised for people with diabetes treated with insulin:

• Do not drive with a blood glucose less than 5mmol/l.

People on Oral Hypoglycaemic Agents (OHA's) (Must notify DVLA)

For people on oral hypoglycaemic agents a license lasting until age 70 will be issued in the absence of other complications.



People on Insulin (Must notify DVLA)

Drivers whose diabetes is treated with insulin will be issued with a 1-, 2- or 3-year license, provided they meet the set criteria. DVLA have now stipulated that any driver on insulin who has more than 2 episodes of severe hypoglycemia (including nocturnal) in a 12-month interval should be advised not to drive and to inform the DVLA. Severe hypoglycemia is classed as any episode of hypoglycemia that requires the assistance of a third party for management. It is likely these individuals will have their license revoked for a period of 12 months.

12 / 15

A 70-year-old man presents into the ED with complaint of frequent falls after standing up from sitting position. Postural hypotension occurs due to which mechanism?

A. Impaired baroreceptor reflex



- **B.** Impaired Chemoreceptor reflex
- C. Peripheral pooling of blood in old age
- D. Patient treated on Sympathomimetic agent
- E. Chronic venous insufficiency



 Orthostatic hypotension (Postural hypotension): fainting or lightheadedness on standing may occur in individuals whose baroreceptor reflex mechanism is impaired (e.g., individuals treated with sympatholytic agents) or who are volume depleted.

13 / 15

A 28-year-old pregnant female presents to the obstetric clinic referred by her GP with complaint of glycosuria with repeated and random urine sample. What is the likely cause of glycosuria in pregnancy?

- A. Increased reabsorption of glucose from renal tubules
- B. Decreased renal threshold for glucose



C. Increased renal threshold for glucose



- D. Decreased insulin resistance
- E. Increased glucagon resistance

Glycosuria is more common during pregnancy because of the lowering of the renal threshold for glucose excretion.

The increase in the glomerular filtration rate delivers an overwhelming glucose load to the renal tubules. Reabsorption, which is normally complete, is thus compromised.



A 70 years old male brought into the ED with complaint of lethargy and generalized ecchymoses. He is known to be alcoholic. Lab values reveal platelets 20000, TLC count 20000, increased PT, increased APTT and low fibrinogen concentration. What is the most likely diagnosis?

- A. Von Willibrand disease
- B. Acute fulminant hepatic failure
- C. Septic shock syndrome
- D. Disseminated intravascular coagulation

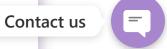


E. Idiopathic thrombocytopenic purpura

Lab values of Disseminated intravascular

- Low platelet count
- Low fibrinogen concentration
- Prolonged PT
- Prolonged PT
- Prolonged APTT
- High levels of D-Dimers
- Features of hemolysis

High yield:



Hemophilia	Normal PT
	Prolonged APTT
	Low factor Viii
	Normal platelets
Von	Normal PT
Willibrand	Prolonged APTT
disease	Low factor Viii
	Low VWF level
	Normal platelets

Regarding the measurement of glomerular filtrate rate, why creatinine is being used?

- A. Creatinine is freely filtered and secreted by nephron
- B. Creatinine is not filtered by nephron
- C. Not freely filtered but freely secreted
- D. Creatinine is freely filtered and not secreted by nephron



E. Not freely filtered and not secreted by nephron

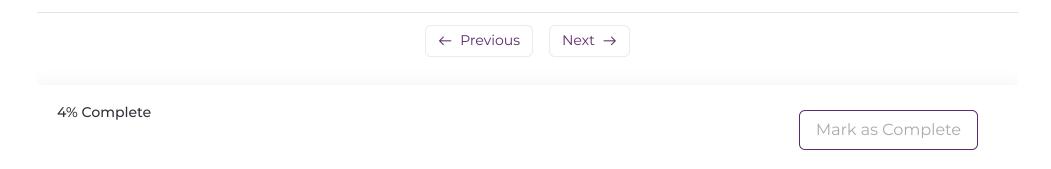
Clearance of a substance can provide an accurate estimate of the glomerular filtration rate (GFR)

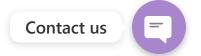




Creatinine is used to calculate GFR because:

- Freely filtered
- Not reabsorbed in the nephron
- Not secreted in the nephron
- Not synthesized or metabolized by the kidney

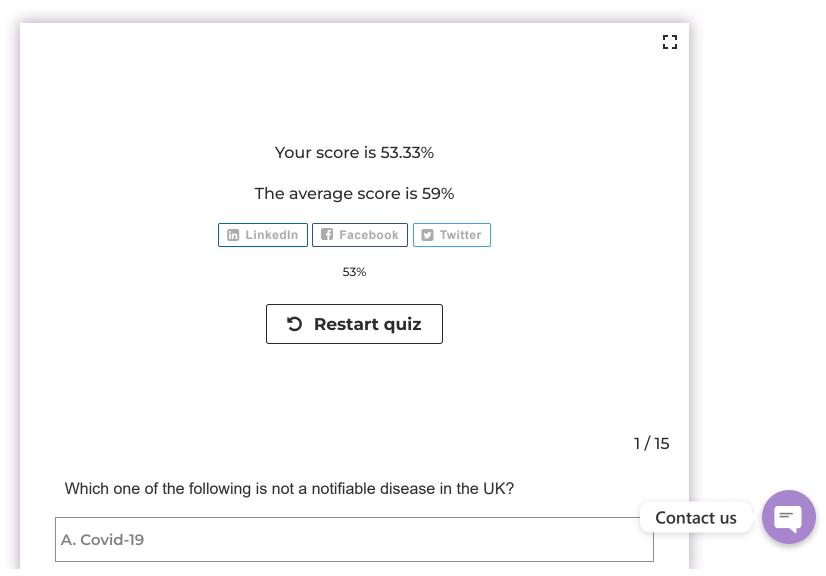




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About Lesson



B. Measles	
C. Chicken pox	
D. Small pox	
E. Malaria	
You can't remember all notifiable disease in UK. It's better to concentrate on Non notifiable disease which includes HIV, chicken po and epstein barr virus (EBV)	
A 60-year-old male presents to the ED with complaint of fatigue. Lab value reveals anemia, Lymphocytosis, and thrombocytopenia. Which one of the following malignancies is most common in UK?	2/15
A. CML	
B. ALL	
C. AML	
D. Hodgkin lymphoma	Contact us



Leukemia (High yield)

1: Acute Leukemia

AML (Common in Adults)

Clinical

- Thrombocytopenia
- Anemia
- Neutropenia

2: ALL (common in Children) Recall

Greater than > 20% blast cells

Philadelphia chromosome translocation 9:22

Clinical

- Thrombocytopenia
- Anemia
- Neutropenia
- Lymph adenopathy
- Splenohepatomegaly
- CNS involvement



Chronic Leukemia

1: CML (15% leukemia) (40-60 years peak age)

Dx = 98% Philadelphia chromosome

Mature myelocytes but a greater amount

Clinical

- Anemia
- Thrombocytes greater or less
- WBC greater
- Basophilia
- Splenomegaly

2: CLL =} 60-80 years overall most common also in UK

Lymphocyte mature function abnormally

Clinical

- Fatigue most common symptom
- Lymphadenopathy
- Lymphocytosis
- Thrombocytopenia
- Anemia
- Bone marrow biopsy smudge cells

Multiple myeloma:

Neoplastic disease characterized by plasma cell accumulation in bone marrow





Useful mnemonic OLD-CRAB

- Old age usually in 60-70
- hypercalcemia
- Renal impairment
- Anemia
- Bone pain

Note IgG (Recall) (60% Cases and IgA (20% Cases) are the immunoglobulins most often found in high amounts in people with multiple myeloma.

3/15

A 5-month-old baby with signs of meningitis was brought into the ED. Her mother states that the baby is up to date with immunization schedule. Which one of the following vaccines are not given?

- A. Polio
- B. Rota virus
- C. Diphtheria
- D. Hep-B
- E. Men-C

Contact us



Useful Mnemonic Rhip-DPT vaccine in series

Rotavirus	2 and 3 months
Hepatitis B	2, 3, and 4 months
Hib	2, 3, 4 and 12 months (Recall)
Pneumococcal	3 and 12 months
Diphtheria, polio and tetanus	2, 3, 4 months, preschool and 14 years
MMR	12 months and preschool (Recall)
MenC	12 months
MenACWY	14 years

- Note: Live vaccines are contraindicated in Immunosuppression (Recall), pregnant women, and anaphylactic reactions to vaccine
- Live vaccines include BCG, oral polio, MMR, Varicella.

A 15 years old male known case of sickle cell disease with a history of splenectomy 1 year back presented to the ED with complaint of bloody diarrhea. What is the most likely causative agent?

A. Hemophilus influenza

B. Staph aureus

C. Pseudomonas aeruginosa





QUIZ : 22 MRCEM EXPERT	
D. Neisseria meningitides	
E. E-Coli	
• <u>High yield:</u>	
Post splenectomy:	
 They are prone for encapsulated organisms. 	
• NHS mnemonic.	
N- Neisseria meningitides	
• H - Hemophilus influenza	
 S - Streptococcus Pneumonia (Most common) 	
 Other pathogens in such infection may include bacteria such as 	
Escherichia coli and Pseudomonas aeruginosa.	
• E-Coli causes post-splenectomy bloody diarrhea or gastroenteritis.	
	5 / 15
Regarding the attachment of metatarsal bone, which one of the following metatarsal attaches to lateral coniform?	
A. 4th metatarsal	
B. 3rd metatarsal	
C. 1st metatarsal	
D. 5th metatarsal	Contact us

D. 5th metatarsal



Lateral cuneiform	Navicular posteriorlyCuboid laterally3rd metatarsal anteriorly
Intermediate cuneiform	Navicular posteriorly2nd metatarsal anteriorly
Medial cuneiform	Navicular posteriorly1st metatarsal anteriorly

Note: Medial dorsal cutaneous nerve and the **deep peroneal nerve** (Recall) on the dorsal aspect are anesthetized in metatarsal fracture surgery

6/15

Which one of the following stages of bone healing is followed by inflammation and proliferation?

A. Consolidation

B. Organization

C. Callus formation



D. Hematoma formation



E. Remodeling

Stages of Bone healing (High yield)

- Hematoma formation (Immediately in Day 1)
- Inflammation and proliferation (8 hours to 1-2 weeks) predominant cells neutrophils and macrophages
- Callus formation (2-3 weeks)
- Consolidation (2 to 3 months)
- Re-modelling (2 months to years) Osteoclasts are responsible

7/15

A 26-year-old male presents to the ED with complaint of fever, fatigue, and sore throat. He further stated that few days back his wife was diagnosed with infectious mononucleosis. Which of the following cells are the most predominant?

A. Basophils

B. Lymphocytes



C. Eosinophils

D. Neutrophils



E. Monocytes

Infectious mononucleosis is often called the kissing disease, caused by Epstein-Barr virus and is spread through saliva.

Lymphocytosis is one of the classical hematological abnormalities associated with Infectious mononucleosis

8/15

A 52-year-old woman presents with a hoarse voice two weeks after neck surgery for a thyroid adenoma.

Which structure is most likely to have been injured during her surgery?

A. Recurrent laryngeal nerve



B. Cricothyroid muscle

C. Vagus nerve

D. Superior laryngeal nerve

E. Thyrohyoid muscle

Most common structures vulnerable to damage in thyroid surgery:



- Recurrent laryngeal nerve
- Parathyroid glands result in hypocalcemia post-surgery (Recall)
- Anterior jugular vein
- Superior thyroid artery

Whilst in your rheumatology rotation you are taking the history of a suspected SLE patient. Your consultant asks which of the following antibody is always high and the most sensitive diagnostic test to confirm SLE.

A. Rheumatoid factor

B. P-Anca

C. C-Anca

D. Antinuclear antibody

E. Anti gliadin antibody

High yield



Antinuclear antibody	SLE (Raised ANA always)
Rheumatoid	RA and Sjogren's syndrome
factor	
Anti-gliadin	Coeliac disease
and	
endomysial	
antibodies	
Acetylcholine	Myasthenia gravis
receptor	
antibodies	
Anti-	Good pastures syndrome
glomerular	
basement	
antibody	
(Anti GBM)	

A 45-year-old man fell from a rooftop and presented with a head injury and hyperventilation. What could be the consequence of hyperventilation?

A. Increased in Pao2

B. Increase in Pco2



C. Decrease in cerebral blood flow



D. Increase in cerebral blood flow

E. Decrease washout of Pco2

- Co2 is vasodilator causes increases cerebral blood flow (Recall)
- Hypoventilation increases C02 and increases cerebral blood flow
- Hyperventilation causes decrease Pco2 and decreases cerebral blood flow

11 / 15

A 20 years old young female with severe iron deficiency anemia HB:4 presents to the ED with complaints of lethargy and pallor. After giving a blood transfusion patient developed a hypersensitivity reaction what type of reaction is this?

A. Type 2

B. Type 3

C. Type 4

D. type 1 hypersensitivity 2



E. Type 5



Hypersensitivity types and examples (High yield)

Type1	Type2	Type3	Type4
IGE	IgG OR IGM	IgG (Recall)	T Cells
mediated			mediated
Urticaria	Red blood	Post-streptococcal	Mostly
Angioedema	cell	glomerulonephritis	Т
Allergic	destruction	(Recall)	Contact
rhinitis	after	Rheumatoid	(Touch)
Hay fever	transfusion	arthritis (Recall)	dermatitis
Anaphylaxis	with	systemic lupus	(Recall)
	mismatched	erythematosus	Tuberculin
	blood		skin test
	(Recall) or		Type 1
	during		diabetes
	hemolytic		Transplant
	disease of		rejection
	the		
	newborn.		

Note:Microcytic anemia Growth retardation hepatosplenomegaly = Thalassemia

12 / 15

A 27-year-old male presents to the ED with a superficial wound on his right thigh. Your senior registrar decided to let it heal with primary intention. After 2 days





which one of the following cells will be predominant?

- A. Eosinophils
- B. Lymphocytes
- C. Neutrophils
- D. Fibroblasts
- E. Macrophages 💥



Inflammatory cells predominant: Neutrophils up to 3 days and replaced by macrophages by day 3

High yield:

Acute inflammation: IL-1 and TNF alpha are key cytokines

CRP: Protein made by the liver suggests acute infection or inflammation. IL-6 primarily stimulates the production of CRP (Recall)

Note: Kupffer's cells are specialized macrophages (Recall) found in sinusoids of the liver and function as phagocytic and defense of the liver



Acute	Chronic inflammation
inflammation	
Rapid onset	Slow onset
Innate	Adaptive immunity
immunity	
Neutrophil	Macrophages and
predominant	lymphocytes
	predominant
	Note: The granulomatous
	inflammatory response is
	a special type of chronic
	inflammation
	characterized by often
	focal collections of
	macrophages, epithelioid
	cells and multinucleated
	giant cells (Recall)

A 62-year-old man presents with a stab wound to his scalp. The wound appears superficial but it is bleeding profusely

What pathway is most important for the primary haemostasis of this wound?

Contact us



A. Conversion of prothrombin to thrombin



B. Activation of Protein S

C. Activation of Protein C

D. Activation of von Willebrand factor

E. Conversion of fibrinogen to fibrin

Von Willebrand factor is a glycoprotein involved in haemostasis i.e., when a person starts to bleed after injury the VWF in the blood attaches to small blood cells called platelets. This helps the platelets stick together, like glue, to form a clot at the site of injury and stop the bleeding.

14 / 15

10 years old boy with an allergy to nuts was brought into ED with complain of widespread urticarial rash associated with breathlessness. You suspect anaphylaxis, which one of the following cells is responsible for that?

A. Monocytes

B. Basophils

C. Mast cells 🕡

D. Neutrophils

E. Eosinophils

Mast cells are considered the primary cells responsible for driving anaphylaxis in humans through its degranulated products histamine and tryptase.

15 / 15

A 24-year female with a history of C-section2 weeks back presents to the ED came with complaint of delayed wound healing. What is the most likely cause?

A. Infection on the site



B. In this age wound heals slowly

C. Reduced fibroblast

D. Increased collagen activity

E. Collagen decrease in pregnancy



Causes of decreased wound healing

• Frequent trauma, Tissue hypoxia and Infection
Others include: Increased age, immunocompromised and deficiency of vit A, C and zinc

← Previous Next →

4% Complete

Mark as Complete

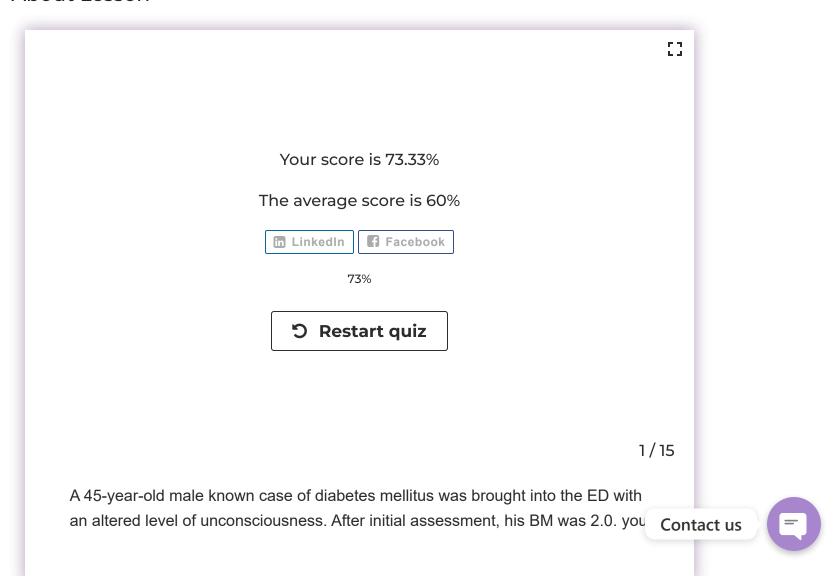
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decided to give him 1mg IM glucagon. What is the mechanism of action of glucagon in hypoglycemia?

- A. Glucogenolysis
- B. Promote glycogen formation
- C. Glycogenolysis
- D. Glycogenesis
- E. Decrease glucose release

Glucagon released from alpha cells of pancreas promotes hepatic conversion of glycogen to glucose (glycogenolysis), stimulates glucose synthesis (gluconeogenesis), and inhibits glucose breakdown (glycolysis) and glycogen formation (glycogenesis)

Insulin is released from the beta cells of pancreas. **insulin act on tyrosine kinase receptor to activate intracellular pathway (Recall)** result in translocation of glut-4 glucose transporter to the cell membrane.



Which one of the following muscles of thigh is responsible for adduction of thigh at hip joint and flexion of leg at knee joint?

A. Gracilis

B. Adductor longus

C. Rectus femoris

D. Adductor magnus

E. Sartorius

Motor supply: Medial thigh muscles (adductor longus, brevis and magnus, **gracilis**, obturator externus) Sensory supply Upper medial thigh

Gracilis: Adducts the thigh at hip joint and flexes leg at knee joint

3/15

A 35-year-old male presents to the ED with complaint of pain in epigastrium secondary to chronic NSAID use. If you suspect a peptic ulcer, which one of the following arteries is responsible for bleeding peptic ulcer disease?



4/15
Contact us

E. Chymotrypsin

Digestion of carbohydrates start from mouth with salivary amylase but primarily takes place in small intestine by action of pancreatic enzyme amylase

Fat digestion in small intestine by pancreatic enzyme lipase

Protein digestion in small intestines by pancreatic enzyme Trypsin and Chymotrypsin

5 / 15

Which of the following substances is released from neurons in the GI tract and produces lower oesophageal relaxation?

A. Secretin

B. Gastric inhibitory peptide (GIP)



C. Vasoactive intestinal peptide (VIP)



D. Cholecystokinin (CCK)

E. Gastrin

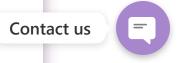


Vasoactive intestinal peptide (VIP) is a gastrointestinal neurocrine that causes the relaxation of GI smooth muscle. For example, VIP mediates the relaxation response of the lower esophageal sphincter when a bolus of food approaches it, allowing passage of the bolus into the stomach.

Note: Ileocecal valve relaxation is due to gastrin



Cholecystokinin	Increase production of bile + stimulate release of stored bile
	Inhibit gastric emptyingInhibit gastric acid production
	 Release inhibited by somatostatin
Secretin	Increase production of bile
	 Inhibit gastric emptying
	Inhibit gastric acid
	production
	 Release inhibited by somatostatin
Gastrin	Stimulated by gastric distention +
	Raised gastric PH and function as
	raising gastric acid secretion
	from gastric parietal cells
	(Recall), Pepsinogen from gastric chief cells
	Release inhibited by
	Cholecystokinin, Secretin and
	somatostatin
Somatostatin	Somatostatin produces
	predominantly neuroendocrine
	across multiple systems. It is



known to inhibit GI, endocrine, exocrine, pancreatic, and pituitary secretions,

6/15

A 55 years old male known case of HTN and CKD presents with complain of easy fatigability and pale skin. Lab values reveal HB: 8 and decreased level of hematocrit, Peripheral film shows normocytic normochromic anemia. What is the most likely cause?

A. Anemia of chronic disease



B. Sideroblastic anemia

C. Decrease erythropoietin



D. Hemolytic anemia

E. Increase erythropoietin

In patients with chronic kidney disease, normochromic normocytic anemia mainly develops from decreased renal synthesis of erythropoietin.



7 / 15

You prescribed proton pump inhibitor to a patient with duodenal ulcer. Regarding pathophysiology of peptic ulcer disease which one of the following statements is correct?

- A. Increased prostaglandin synthesis
- B. Thick gastric mucosa formation
- C. Decreased Hcl secretion from gastric parietal cells



- D. Decrease gastrin secretion
- E. Decrease prostaglandin synthesis



The gastrointestinal mucosa contains relatively large amounts of prostaglandin. Prostaglandins are important in the pathophysiology of peptic ulcer disease and possibly in its prevention and treatment as well. Prostaglandins have been shown to inhibit gastric secretion, stimulate bicarbonate secretion, and increase gastric blood volume.

8/15

You prepare to perform a femoral nerve block on a 23-year-old man that has suffered a femoral shaft fracture in a motorcycle accident.





Which SINGLE statement regarding the femoral nerve is FALSE?

A. It is formed within the psoas major muscle

B. It's formed within piriformis muscle



C. It divides into anterior and posterior divisions in the femoral triangle

D. It is the largest branch of the lumbar plexus

E. It enters the thigh beneath the mid-point of the inguinal ligament

The femoral nerve is the largest branch of the lumbar plexus. It is derived from the anterior rami of nerve roots L2, L3, and L4.

After arising from the lumbar plexus, the femoral nerve travels inferiorly through the psoas major muscle of the posterior abdominal wall. It supplies branches to the iliacus and pectineus muscles prior to entering the thigh. The femoral nerve then passes underneath the inguinal ligament to enter the femoral triangle. Within this triangle, the nerve is located lateral to the femoral vessels (Recall) (unlike the nerve, the femoral artery and vein are enclosed within the femoral sheath).

Approximately 4cm below the inguinal ligament, the femoral nerve divides into anterior and posterior divisions:

The function of femoral nerve: Motor functions: Innervates the anterior thigh muscles



Sensory functions: **Supplies cutaneous branches to the anteromedial thigh (Recall)** (anterior cutaneous branches of the femoral nerve)

9/15

A 60-year-old man with chronic pancreatitis attends with symptoms of malabsorption.

A decrease in which enzyme is most likely to be affecting protein digestion?

- A. Esterase
- B. lipase
- C. Trypsin
- D. lactase
- E. Amylase
- Digestion of carbohydrates start from mouth with salivary amylase but primarily takes place in small intestine by action of pancreatic enzyme amylase (Recall)
- Fat digestion in small intestine by pancreatic enzyme lipase
- Protein digestion in small intestines by pancreatic enzyme Trypsin and
 Chymotrypsin



10 / 15

A 25-year-old man presents with an incised wound to the antecubital fossa. There is a complete transection of the brachial artery at this level.

Which artery is most likely to remain intact?

A. Profunda brachii

B. Deep palmar arch

C. Superficial palmar arch

D. Ulnar

E. Radial

Immediately distal to the teres major, the brachial artery gives rise to the **profunda brachii** (deep artery), which travels with the radial nerve in the radial groove of the humerus and supplies structures in the posterior aspect of the upper arm (e.g., triceps brachii). Incised wound at antecubital fossa and complete transection of brachial artery at this level will spare deep branch of brachial artery that is profunda brachii.



11 / 15

Regarding gastric emptying which one of the following Hormone inhibit gastric emptying?

A. Secretin

B. Glucagon

C. Gastric inhibitory peptide

D. Insulin

E. Vasoactive intestinal peptide

Gastric emptying



Gastric emptying increased by:

- Fall in the pH of chyme in stomach
- Pyloric antrum distention
- Parasympathetic stimulation

Gastric emptying decreased by hormones cholecystokinin and secretin

- Fall in the pH of chyme in duodenum (Recall)
- Duodenal distention

12 / 15

The following statements regarding the obturator nerve are correct except which?

A. It originates from the lumbar plexus

B. It divides into an anterior and a posterior division

C. It innervates the adductor muscles of the thigh.

D. It enters the thigh immediately beneath the inguinal ligament



Contact us



E. It supplies the skin on the medial side of the thigh

The obturator nerve arises from the lumbar plexus (L2, 3, and 4) and runs forward on the lateral wall of the pelvis to reach the obturator canal

Obturator nerve:

- Motor supply: Medial thigh muscles (adductor longus, brevis and magnus, gracilis, obturator externus)
- Sensory supply Upper medial thigh
- Injury Motor Loss: Loss of hip adduction (Recall)
- Sensory Loss: Loss of sensation over upper medial thigh

13 / 15

You prescribed H2 receptor blocker to a patient with duodenal ulcer. your junior fellow asks, what is the effect of H2 blockers on HCL secretion?

A. Decrease gastric acid



- B. Decrease gastric acid acting on G-cells
- C. Increase gastric acid acting on chief cells of stomach
- D. Decrease gastric acid acting on chief cells of stomach

E. Increase gastric acid



H2 blocker decrease gastric acid secretion by reversibly binding to histamine H2 receptors located on gastric parietal cells, thereby inhibiting the binding and activation of the endogenous ligand histamine

Parietal cells	Secrets HCL (Recall) +
	intrinsic factor
Chief cells	Secrete pepsinogen
	(Recall)
G-cells	Secrete gastrin
Enterochromaffin cells	Secrets histamine
Surface mucus cells	Secrete mucus

14 / 15

You are discussing facial nerve and their branches with a group of medical students. Which one of the following facial nerve branches is involved in the Wrinkling of the forehead?

A. Zygomatic branch

B. Temporal branch of facial nerve



C. Buccal branch

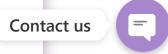




D. Greater petrosal nerve

E. Posterior auricular nerve

Facial nerve branches in temporal bone	Facial nerve terminal branches in the parotid gland
Chorda tympani: Ant 2/3 of taste (RECALL) While Ant 2/3 of general sensation: mandibular division of trigeminal nerve	Temporal branch: innervate muscles in the temple, forehead (Frontalis muscle) and supraorbital areas (upper half of orbicularis oculi muscle) Occipitofrontalis muscle: Frontal belly: Elevates eyebrows, wrinkles skin of forehead innervated by temporal branch Occipital belly: Retracts scalp innervated by posterior auricular nerve
Greater petrosal nerve: Parasympathetic innervation to lacrimal and mucous glands	zygomatic branch: innervate muscles in the infraorbital area (Lower half of orbicularis oculi muscle) Recall lateral nasal area and upper lip Buccal branch: muscles in the cheek and upper lip (Recall)
	Marginal mandibular



of lower lip and chin

or lower lip and crim

Dianen, innervate maseres

15 / 15

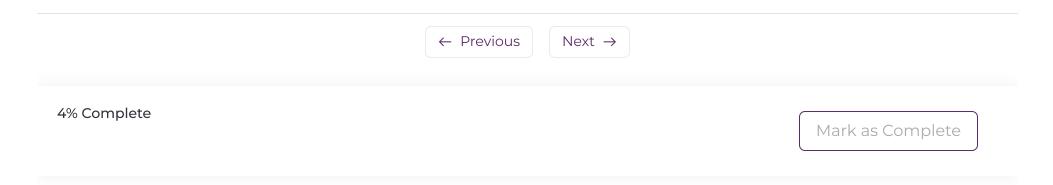
A 12-year-old Mediterranean child was brought into the ED with complaint of lethargy and growth retardation. On examination of the abdomen hepatosplenomegaly was found. Which one of the following hypochromic microcytic anemias is the most likely the cause of his condition?

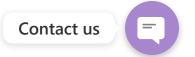
- A. Iron deficiency anemia
- B. Sideroblastic anemia
- C. Anemia of chronic disease
- D. Thalassemia 🎻
- E. Hemolytic anemia

Sign and symptoms of Beta thalassemia major:

- Pallor, fatigue, irritability
- 2 Growth retardation.
- Recurrent infections
- Bony abnormalities specially of the facial bones
- Enlarged spleen and liver.
- Delayed sexual development







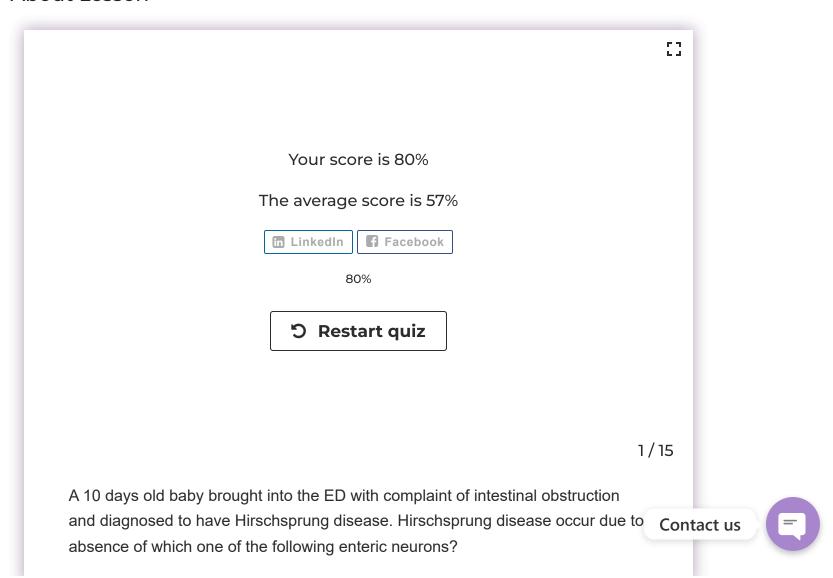
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E Comments

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A. Pacinian corpuscles	
B. Mucosal plexus	
C. Myenteric plexus 🗸	
D. Glial cells	
E. Endothelial cells	
Hirschsprung disease results from the absence of parasympathetic ganglion cells in the myenteric and submucosal plexus of the rectum and/or colon	2/15
A 40 years old male presents to the ED with complaint of lacerated wound on medial compartment of thigh, on examination he is unable to perform extension and medial rotation. Which one of the following muscles is most likely injured?	ŕ
A. Adductor magnus 🕡	
B. Gracilis	
C. Adductor brevis	

D. Adductor longus

E. Obturator externus

EXP: All the muscles of medial compartment of thigh are innervated by obturator nerve except hamstring portion of adductor magnus.

> Adduction and medial rotation Adductor part: Obturator at hip nerve

Adductor magnus

Hamstring part: Adduction and extension of thigh at hip

Hamstring part: Sciatic nerve (tibial division) Recall

3 / 15

A 55 years old male known case of benign prostatic hyperplasia presents into the ED with complaint of urinary retention. He was prescribed doxazosin for urinary retention, drug given act on which receptor?

A. Anti muscarinic



B. Alpha 1 adrenoreceptor blocker



C. Acetylcholine

D. Anticholinesterase





E. dopamine

Doxazosin is an Alpha 1 adrenoreceptor blocker. It relieves the symptoms of urinary retention

Note: Anti-muscarinic drugs cause urinary retention, dry mouth, pupil dilation and constipation (Recall)

4/15

Regarding Einthoven's triangle, which one following show maximum deflection during ventricular depolarization?

A. Right arm and left leg



B. Left arm and left leg



C. Left arm and Right leg

D. Right arm and right leg

E. Left arm and right arm

The three limb electrodes, I, II and III form a triangle (Einthoven's Triangle), at the right arm (RA), left arm (LA) and left leg (LL).

Lead 1= Left arm(+Ve) and right arm (-Ve)





Lead2 = left leg(+Ve) and Right arm (-Ve)

Lead 3= Left leg(+Ve) and left arm (-Ve)

Lead 2 normally shows largest deflection during ventricular depolarization as the muscle mass is greatest and depolarization travels from apex to base

5 / 15

A 50 years old female known case of inflammatory bowel disease presents to the ED with complaint of pain in right lower quadrant and bloody diarrhea. Regarding management of I.B.D which one of the following treatment options is best given initially?

- A. Hydrocortisone IV
- B. Rectal prednisolone
- C. Oral prednisolone
- D. Oral azathioprine
- E. Rectal mesalazine

A stepwise approach that is used for IBD management is outlined below.



The first step in pharmacologic therapy for IBD is aminosalicylates (Mesalazine) If the patient does not respond to an appropriate dose of aminosalicylates, the second step is the addition of corticosteroids, which tend to result in a significant decrease in inflammation. Once the response is seen, the dose can be tapered

For those with mild to moderate disease limited to the rectum, aminosalicylate agents like mesalamine are the mainstay of treatment and are best given rectally

6/15

You are examining a patient of femoral hernia; your consultant asks which structure is bordered medially to the femoral canal?

- A. Femoral vein
- B. Femoral nerve
- C. Inguinal ligament
- D. Lacunar ligament
- E. Pectineal ligament

Femoral canal lies most medial of the femoral sheath.

Femoral sheath encloses femoral artery, femoral vein and femoral canal. Femoral nerve does not lie within femoral sheath. (Recall)





Borders of the femoral canal: (Useful mnemonic LAMP: FILP)

- Lateral border: Femoral vein (Immediately lateral) Recall.
- Anterior border: Inguinal ligament
- Medial border: Lacunar ligament
- Posterior ligament: Pectineal ligament, Pectineus muscle and superior ramus of pubic bone.

High Yield:

Contents of femoral triangle:

From lateral to medial: Useful mnemonic (NAVEL)

- Femoral nerve
- Femoral artery
- Femoral vein
- Empty space (consists of femoral canal)
- Lymph nodes

Note: Femoral nerve lies lateral to femoral artery and vein (Recall)

7/15

A 14 years old male brought into the ED with complaint of fever and neck rigidity. You suspect meningitis, what are the typical CSF changes in meningitis?

A. Tuberculous meningitis has more polymorphs than mononuclear cells in

Contact us



CSF

B. CSF can appear turbid in Viral meningitis

C. In bacterial meningitis the CSF protein is 0.4 g/L

D. Glucose is less than half of blood glucose in viral meningitis

E. CSF can appear clear in viral meningitis



Normal CSF glucose is less and 60% of the level of serum glucose

- Glucose is more than half of blood glucose (Normal) in viral meningitis. In bacterial and TB meningitis CSF to serum glucose ratio falls
- Tuberculous meningitis has more mononuclear cells than polymorphs in CSF. Predominant cells in viral and TB meningitis are Lymphocytes while predominant cells in bacterial meningitis are Neutrophils
- In bacterial meningitis CSF protein is raised to 0.5–2.0 g/L.)
- CSF is clear in viral meningitis and CSF is turbid in bacterial meningitis

8/15

A 36 years old male sustained trauma to his right foot and presents to the ED with infected wound. Which one of the following local factors impede wound healing?

A. Decreased skin tension

B. Damage to the sensory nerves around the wound



C. Increased blood supply

D. The presence of necrotic tissue



E. Decreased local mobility

Wound healing is impaired by a poor blood supply to the wound and a poor venous drainage from the wound. Increased skin tension caused by tight sutures and the presence of infection, foreign bodies and necrotic tissue are other local factors that impede healing.

9/15

20 weeks pregnant Lady presents to the ED with herpetic rash. You plan to give iv acyclovir, what is the mechanism of action of acyclovir?

A. viral DNA synthesis inhibitor



B. Viral RNA synthesis inhibitor

C. Bacterial cell wall inhibitor

D. Viral protein synthesis inhibitor

E. Bacterial DNA synthesis inhibitor



Acyclovir acts to inhibit viral synthesis of DNA

High yield:

Regarding antibiotics:

1: Protein synthesis inhibitor

- Aminoglycosides
- Macrolides
- Chloramphenicol
- Tetracycline
 - 2: Nucleic acid Synthesis inhibitor
- Metronidazole
- Quinolones
 - 3: Cell wall inhibitor
- B lactam antibiotics

10 / 15

A 27 years old male patient diagnosed and treated for hepatitis B. In hep-B infection, which one of the following serology reports you will see?

A. Anti-HBs, anti-HBe

B. HbsAg+ and HbeAg+ve

C. Anti HBs

D. HbeAg+ and HbeAb-ve

E. HbsAg+ and HbeAg-ve

Acute hepatitis B HBsAg +Ve, HBeAg +Ve, anti-HBc IgM

Chronic hepatitis B HBsAg +Ve, HBeAg +Ve, anti-HBc IgG

Immunity following infection Anti-HBs, anti-HBe, anti-HBc IgG

Immunity due to vaccination Anti-HBs

11 / 15

A 30-year-old female had bloody diarrhea 2 weeks ago. Now she presents to the ED with complaint of joint pain, mouth ulcers and brown raised plaques on palms and soles. Reactive arthritis diagnosis was made. Which one of the following organisms cause reactive arthritis?

A. Neisseria gonorrhea 💥



B. Staphylococcus aureus

C. Campylobacter jejuni 🕡



D. Clostridium difficili



E. Pseudomonas aeruginosa

Reactive arthritis (Reiter's syndrome) is a triad of urethritis, arthritis and conjunctivitis.

Organisms causing reactive arthritis: Chlamydia, Salmonella, Campylobacter jejuni and Shigella

12 / 15

An 8-year-old child is planned for tonsillectomy for the grade 3 enlarged tonsils.

During surgery which artery will be most common cause of primary haemorrhage during surgery

- A. Descending palatine artery from maxillary
- B. Dorsal lingual branches
- C. Ascending pharyngeal artery
- D. Branches of internal carotid
- E. Tonsillar branch of facial artery



Main supply to tonsils is from tonsillar branch of facial artery. While all others supply minutely to tonsils



13 / 15

A 10-year-old child was brought into the ED following head trauma with complaint of hydrocephalus. Imaging resulted in swelling of one lateral ventricle which of the following is the most likely site of blockage

- A. Subarachnoid space
- B. Foramen Monro
- C. Sub arachnoid cisterns
- D. Aqueduct of Sylvius
- E. Foramen Luska

The flow of CSF Useful Mnemonic

Little Infants Try Crying for Food. Sub arachnoid space

- Lateral ventricle
- Interventricular foramina of (Monro)
- Third ventricle
- Cerebral aqueduct
- Forth ventricle
- Foramina of Luschka
- Sub arachnoid space



Note: From subarachnoid space **CSF** is reabsorbed by arachnoid granulations (Recall) back into the circulation

14 / 15

A 32-year-old male with a history of RTA presented to ED with Complain of pain in his Right shoulder. X-ray was done which shows anterior shoulder dislocation. Which one of the following ligaments is most likely injured?

- A. Transverse humeral ligament
- B. Glenohumeral ligament
- C. Coraco-clavicular ligament
- D. Acromioclavicular ligament
- E. Coracoacromial ligament

The shoulder joint

Type: synovial ball and socket joint

Shoulder joint is formed by the articulation of the **head** of the humerus with the **glenoid cavity** of the scapula



Ligaments of the shoulder joint:

In the shoulder joint, the ligaments play a key role in stabilizing the bony structures.

- Glenohumeral ligaments (superior, middle and inferior) They act to stabilize the anterior aspect of the joint. They are the main source of stability for the shoulder (Recall), holding it in place and preventing it from dislocating anteriorly.
- **Coracohumeral ligament:** It supports the superior part of the joint capsule.
- Transverse humeral ligament: This ligament spans the distance between the two tubercles of the humerus. It holds the tendon of the long head of the biceps in the intertubercular groove
- Coraco-clavicular ligament: This ligament composed of the trapezoid and conoid ligaments and runs from the clavicle to the coracoid process of the scapula. They work alongside the acromioclavicular ligament to maintain the alignment of the clavicle in relation to the scapula.
- Coracoacromial ligament. This ligament runs between the acromion and coracoid process of the scapula it forms the coraco-acromial arch. This structure overlies the shoulder joint, preventing superior displacement of the humeral head.

Stability of the joint

- Rotator cuff muscles [SITS MUSCLES] Recall
- Glenoid labrum: A fibrocartilaginous ridge surrounding the glenoid cavity
- **Ligaments:** Extra Capsular ligaments form the coraco-acromial arch.



• **Biceps tendon** – it acts as a minor humeral head depressor, thereby contributing to stability.

Movements of the shoulder joint: Shoulder joint is highly mobile ball and socket joint allows various movements like flexion, extension, adduction, abduction, medial rotation, lateral rotation and circumduction

CLINICAL PEARL:

Shoulder joint dislocations

Anterior shoulder dislocation: Most common injury results from forceful abduction, extension and external rotation

Clinical features:

- Arm usually abducted and externally rotated
- Humeral head often palpated anteriorly
- Patient cannot touch contralateral shoulder with hand of affected extremity.

Complications of anterior shoulder dislocation:

- Injury to axillary nerve (Recall)
- Injury to axillary artery
- Injury to rotator cuff

Posterior Shoulder dislocation: occurs occasionally results from direct blow to the arm that produces forceful internal rotation and



adduction.

Clinical features:

- · Arm usually adducted and internally rotated
- Patient unable to perform external rotation

Complications of posterior shoulder dislocation [less common neurovascular injury]

- Fracture of posterior glenoid labrum
- Fracture of humeral shaft or lesser tuberosity

Note: **Light bulb sign** on the X-ray is the diagnostic feature of posterior shoulder dislocation

15 / 15

A 14 years old child swallows a coin, it lodged in esophagus, which one of the following structures compress esophagus at thoracic level?

- A. Left vagus nerve
- B. Posterior surface of the heart
- C. Aortic Arch
- D. Left brachiocephalic vein

E. Diaphragmatic hiatus

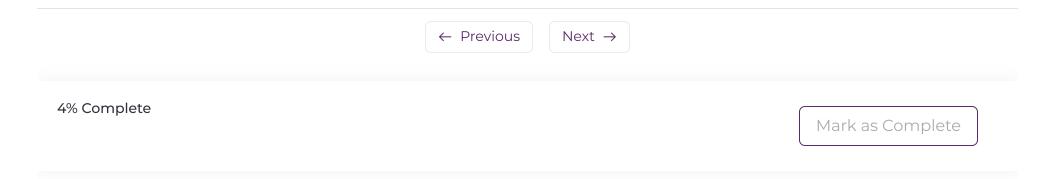


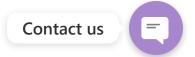


The anatomical relations of the oesophagus give rise to four **constrictions, where** food/foreign objects are most likely to become impacted

The esophagus has 3 anatomic constrictions.

- 1: Pharyngoesophageal constriction is at the junction with the pharynx
- 2: Thoracic(aortobronchial) constriction: The second is at the crossing with the aortic arch and the left main bronchus
- 3: Diaphragmatic constriction: The third is at the junction with the stomach





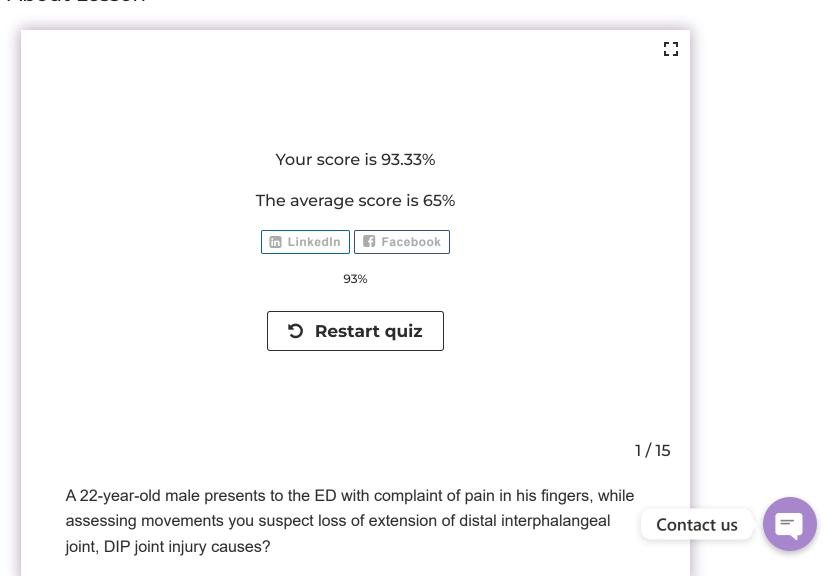
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🗐 Overview 🕟 🖪

E Comments

About Lesson



Α.	Z-	D	ef	fo	r	n	٦	ity	/
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- B. Carpal tunnel syndrome
- C. Metacarpo-phalangeal joint subluxation
- D. Boutonniere deformity
- E. Mallet finger 🕡

Mallet deformity	Loss of extension of distal interphalangeal joint or fixed flexion of DIP.
Boutonniere deformity	Loss of extension of proximal interphalangeal joint.

2/15

A 25 years old pregnant lady presents to the ED with complaint of nausea, vomiting, pelvic cramps and spotting. She gives history of taking doxycycline prescribed by her GP. Which of the following is common side effect of doxycycline use in pregnancy?



- A. CNS malformation
- B. Cardiac defect
- C. Neural tube defect
- D. Congenital goiter
- E. Tooth discoloration



Intake of tetracycline (Doxycycline) by pregnant women results in the discoloration and deformity of teeth in the fetus. It can also produce impairment of bone growth. tetracyclines are also contraindicated in children less than 10 years

Note:

- Doxycycline is used for malaria prophylaxis (Recall)
- Lithium can cause fetal goiter and cardiac abnormalities. (Recall)

3 / 15

A 30 years old laborer is brought into the ED by Ambulance after falling approximately 6m on building site and sustained fracture to the base of skull. On Examination there is numbness over lip and maxilla.

Which part of skull bone is fractured?



A. Superior orbital fissure	
3. Foramen rotundum 🗸	
C. Foramen spinosum	
D. Foramen ovale	
E. Stylomastoid foramen	
Mandibular branch of trigeminal: Passes through foramen ovale	
Maxillary branch of trigeminal: Passes through foramen rotundum	
Note: Maxillary division of trigeminal via its branch infraorbital nerve gives sensory innervation to lower eyelid, cheek, side of nose and upper lip (Recall)	
	4/15
The following anti-tubercular drug is a potent CYP450 enzyme inducer?	
A. Streptomycin	
3. Ethambutol	
C. Rifampicin 🗸	Contact us

D. Isoniazid

E. Pyrazinamide

Rifampin is a potent inducer of cytochrome P450 enzymes

Enzyme inducers	Enzyme inhibitors
 Increasing the rate of metabolism and hepatic clearance of concurrently administered drugs, which typically results in a decreased pharmacologic effect. 	Decrease hepatic clearance and increase pharmacologic effect.
Useful mnemonic SCRAP GP Sulphonylureas Carbamazepine Rifampicin Alcohol Phenytoin (Recall) Griseofulvin Phenobarbital	Sodium valproate Isoniazid Cimetidine Ketoconazole Fluconazole Alcohol Chloramphenicol Erythromycin Sulfonamides Ciprofloxacin Omeprazole Metronidazole

Side effects of Anti TB drugs:

1: Rifampicin: Orange-red discoloration of body fluids, Hepatitis



- 2: Isoniazid: Hepatitis, Peripheral neuritis
- 3: Pyrazinamide: Hepatotoxicity, Hyperuricemia
- 4: Ethambutol: Optic neuritis, Red-green color blindness
- 5: Streptomycin: ototoxicity, Nephrotoxicity, and **contraindicated in pregnancy**

5 / 15

What type of immunity is provided by intravenous (IV) administration of immunoglobulin G?

- A. Passive
- B.. Active
- C. Cell mediated
- D. . Humoral
- E. Both humoral and cell mediated

Intravenous administration of immunoglobulin provides the patient with passive immunity. Cellular(cell-mediated) immune response acts directly to destroy pathogens without using antibodies but instead fights infection from macrophages that kills pathogens. The humoral



immune response (or antibody-mediated response) protects the body by circulating antibodies to fight against pathogens (e.g., bacteria).

Passive immunity occurs when antibodies are transferred by antibodies from an immune host, such as from a placenta to a fetus. Passive immunity is short lived. Active immunity is longer lived and comes from the host itself.

6/15

A 26-year-old male returns home from a holiday and complains of three days of dysuria and a purulent urethral discharge. He is diagnosed to be a case of gonorrhea.

Which of the following is the appropriate treatment?

- A. Clarithromycin
- B. Streptomycin
- C. Vancomycin IV
- D. Ceftriaxone IM
- E. Gentamicin



Neisseria gonorrhoeae causes u**rethritis in 1st week (3-4 days)** post exposure and unprotected sex while **Chlamydia trachomatis causes urethritis after 2-3 weeks** post exposure and unprotected sex

Gonorrhoea is usually treated with a single antibiotic injection (usually in the buttocks or thigh). With effective treatment, most of your symptoms should improve within a few days.

• First line IM Ceftriaxone 500mg single dose.

7 / 15

A 32-year-old presents to the ED with complaint of cough with sputum, fever, and night sweats for 1 month. On examination, there is hilar lymphadenopathy. Regarding features of Active TB accompanied with which one of the following features?

- A. ZN staining negative
- B. Fibrotic lung
- C. Usually lower lobe consolidation on X-Ray
- D. X-Ray cavitations

E. Positive Mantoux test



- In the case of active pulmonary TB, a patient can have crepitations, and bronchial breath sounds, and specially over upper lobes cavitations or consolidations
- The Mantoux test is a widely used test for latent TB (Recall): It involves injecting a small amount of a substance called PPD tuberculin into the skin of your forearm. It's also called the tuberculin skin test (TST).

A 15-year-old girl is found to be hyperglycemic. Urine testing reveals glucose. This urinalysis result is most likely to be due to what process in the carrier protein of proximal tubule?

A. . Inborn error of metabolism

B. Destruction

C. Saturation

D. Inhibition

E. . Activation

The renal tubule plays a significant role in glucose reabsorption. If the plasma glucose rises, renal tubular reabsorption of glucose will



increase linearly until it reaches its maximum tubular resorptive capacity. The capacity of the proximal tubule to reabsorb glucose to prevent its passing to the urine is known as the renal threshold. At threshold, the system becomes saturated and the maximal reabsorption rate, the glucose transport maximum is reached and no more glucose can be absorbed. Due to increase in plasma glucose, the filtered glucose exceeds the capacity of the tubular system and the kidneys begin excreting it in the urine, the beginning of glycosuria

9/15

A 30 years old laborer is brought into the ED by Ambulance after falling approximately 6m on building site and sustain head injury. His Gcs 5/15 early treatment given, patient intubated stabilized and shifted to icu. After some time, patient started to deteriorate again with uncontrolled hypertension and bradycardia. Which one of the following reflex leads to this condition?

- A. Autonomic reflex
- B. Baroreceptor reflex
- C. Cortical reflex
- D. Cushing reflex
- E. Medullary reflex



Cushing reflex is physiological response to increase intracranial pressure resulting in Cushing triad of:

- Increased intracranial pressure
- Increased blood pressure
- Bradycardia

10 / 15

A 50 years old male with history of RTA brought into the ED in Shock. After initial assessment CVP line placed in his left subclavian, what is the most common complication of placing CVP in subclavian vein?

- A. High risk of carotid artery injury
- B. Hydrothorax
- C. External jugular injury
- D. Local haematoma
- E. Pneumothorax



Site	Internal jugular vein	Subclavian vein	
<u>Advantage</u>	Low risk of pneumothorax Low failure rate Head-off-table access Easy to stop procedural related bleeding with direct pressure.	Better landmark in obese Pt Easy to maintain dressing Accessible when airway control is being established Low chance of infection	
<u>Disadvantage</u>	Risk of carotid artery injury Dressing and catheter difficult to maintain Thoracic duct injury on left Poor landmark for obese Pt Difficult access during emergency when airway control being established	High risk of pneumothorax Low success rate with inexperienced Catheter malposition more common Interfere with CPR Risk of stenosis	

A 44 years old woman presents to the ED with pain in his right eye, after initial assessment you suspect corneal ulcer. Regarding sensory innervation, which one of the following nerves carry pain sensation from cornea?

A. Optic nerve

B. Mandibular division of trigeminal nerve

C. Maxillary division of trigeminal nerve



D. Opthalmic division of trigeminal nerve



E. Facial nerve

Opthalmic division of trigeminal nerve gives sensory innervation to:

- Forehead and scalp
- Upper eyelid and conjunctiva
- Cornea
- Dorsum of nose

High Yield:

1: Supraorbital nerve: (Branch of Opthalmic division of trigeminal nerve) innervate Skin of upper eyelid, conjunctiva and **upper forehead**

2: Infraorbital nerve (Branch of maxillary division of trigeminal nerve) innervating skin of lower eyelid, side of nose, cheek and upper lip

- 2: Supratrochlear nerve:(Branch of Opthalmic division of trigeminal nerve) innervate Skin of lower forehead
- 3: Naso ciliary nerve (Branch of Opthalmic division of trigeminal nerve) innervate cornea, ciliary body and iris.
- Infratrochlear nerve: Bridge of nose



A 43-year-old driver by profession presents to the ED with seasonal allergies. Which of the following medications would be most appropriate for the management of his allergy symptoms?

- A. Chlorphenamine
- B. Doxylamine
- C. Cyclizine
- D. Fexofenadine

E. Hydroxyzine

First generation H1 antihistamine are sedating and is contraindicated in the treatment of pilots, machine operator and drivers.

The non-sedating antihistamine include (Recall): Fexofenadine, loratadine, Desloratadine, and certizine

13 / 15

A 48-year-old woman complains of bilateral leg swelling which has developed over the last week. She has recently been diagnosed with hypertension and



commenced on treatment 2 weeks ago. Which hypertensive is most likely to have been prescribed?

A. . Atenolol

B. Bendroflumethiazide

C. Amlodipine

D. . Sotalol

E. Ramipril

Pedal edema is one of the most common adverse effects of calcium channel blockers. It has been more common with dihydropyridine calcium channel blockers such as: amlodipine, felodipine, nifedipine (the main cause for calcium channel blocker induced edema increased capillary hydrostatic pressure by arteriolar dilation). but it also seems to occur to a lesser extent with non-dihydropyridine such as verapamil and diltiazem.

• The most common side effect of verapamil is constipation (Recall)

14 / 15

Regarding the movements of extrinsic muscles of shoulder joint, which one of the following muscles performs adduction and internal rotation?



A. Levator scapulae

B. Pectoralis minor



C. Rhomboid minor

D. Latissimus dorsi



E. Rhomboid major

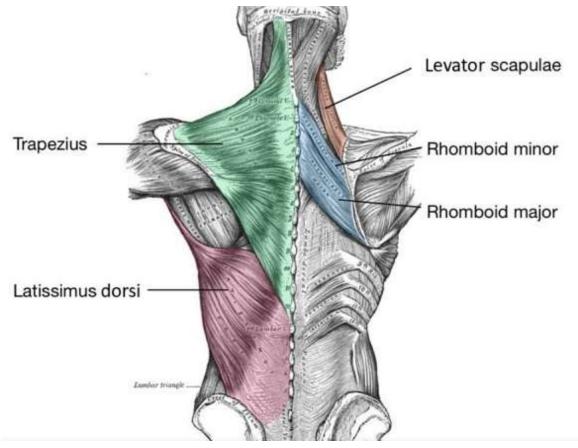
Extrinsic muscles of shoulder Joint:

Muscle	Nerve supply	Nerve root	Function
Trapezius	Spinal part of accessory nerve (motor) and C3 and 4 (sensory)	XI cranial nerve (spinal part)	Upper fibers elevate the scapula; middle fibers pull scapula medially; lower fibers pull medial border of scapula downward
Latissimus dorsi	Thoracodorsal nerve	C6, 7, 8,	Extends, adducts, and medially rotates the arm
Levator scapulae	C3 C4 and dorsal scapular nerve	C3, 4, 5	Raises medial border of scapula
Rhomboid minor	Dorsal scapular nerve	C4, C5	Raises medial border of scapula upward and medially
Rhomboid major	Dorsal scapular nerve	C4, C5	Raises medial border of scapula upward and medially

Clinical pearl: Ask the patient to **shrug his/her shoulder** if the patient is unable to do this indicates spinal accessory nerve injury and **paralysis of trapezius muscle**



11/5/23, 2:31 PM QUIZ : 25 | MRCEM EXPERT



15 / 15

B-blocker was prescribed for hypertension in a female asthma patient. After about a week of treatment, the asthma attacks got worse, and the patient was asked to stop taking the β -blocker. Which of the following β -blockers would you suggest as an alternative in this patient that is less likely to worsen her asthma?

A. Carvedilol

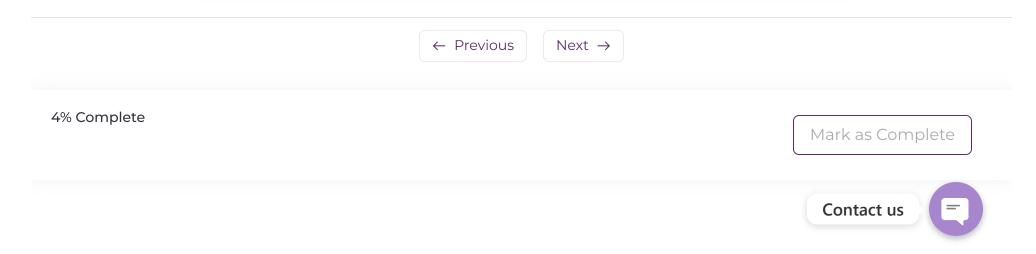
B. Sotalol



C. Atenolol D. Labetalol E. Propranolol

Beta-blockers antagonize catecholamine-induced increases in heart rate, reduce blood pressure and improve left ventricular function, producing proven clinical benefits in people with cardiovascular disease but blocking airway β2-receptors can cause severe and sometimes fatal bronchoconstriction in people with asthma, although cardio selective \(\beta_1\)-blockers may be safer than non-selective

The cardio-selective beta-blockers include atenolol, Bisoprolol, Esmolol, Acebutolol, Metoprolol, and Nebivolol.



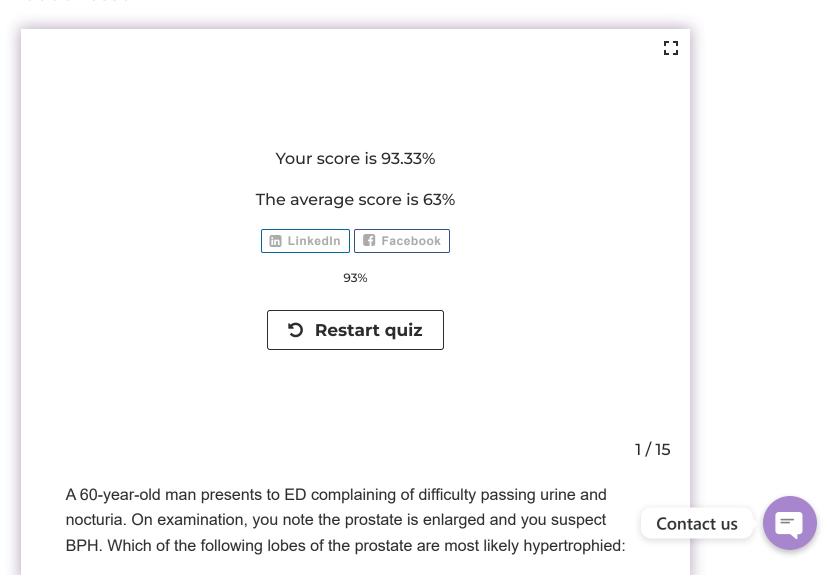
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Overview •

E Comments

About Lesson



- A. Posterior lobe
- B. Anterior lobe
- C. Lateral lobe
- D. Peripheral zone

E. Median lobe



Prostate gland is largest accessory gland of the male reproductive system. Histologically divided into three zones

- 1: Central zone: surrounds the ejaculatory ducts
- 2: Transitional zone: centrally and surrounds the urethra. The glands of the transitional zone are those that typically undergo hyperplasia (BPH) also **median lobe** of prostate most hypertrophied in BPH.
- 3: Peripheral zone: makes up the main body of the gland and is located posteriorly. **High incidence of prostatic carcinoma. This is zone palpated on PR examination.**

2/15

A 74-year-old man with a previous anaphylactic reaction to amoxicillin has had symptoms and signs of pneumonia with a CURB 65 score of 4. His blood cultures Contact us grew mycoplasma pneumonia.



Which single antibiotic is most appropriate for this patient??

A. Meropenem

B. Ciprofloxacin

C.: Clavulanic acid

D. Co amoxiclav

E. Clarithromycin

acquired pneumonia (Recall)

CURB-65 Score is used for Severity assessment of community

- Confusion (abbreviated mental test, AMT scores 8)
- Urea (>7 mmol/L)
- Respiratory rate (2 30/min)
- Blood pressure (< 90 systolic or \$ 60 diastolic)
- 65 (age ≥ 65

Risk

- Score 0 to 1 low risk
- Score 2: Intermediate risk
- Score 3 to 5: High risk

Loe severity CAP: Ist choice Amoxicillin



High severity CAP: Ist choice Co-Amoxiclav

Note: Clarithromycin is widely used alternative treatment in patients with penicillin allergy

3 / 15

You see a 32-year-old woman in the resuscitation room who has presented with tachyarrhythmia. You decide to perform carotid sinus massage. At what level in the neck is the carotid sinus most likely to be found?

- A. hyoid bone
- B. inferior border of 5th cervical vertebra
- C. cricothyroid membrane
- D. superior border of cricoid cartilage
- E. superior border of thyroid cartilage



Carotid Sinus Massage is a Vagal maneuver transiently increase the arterial pressure in the carotid sinuses and aortic arch. This action triggers the baroreceptor reflex, which results in increased parasympathetic output to the heart via the vagus nerve and lowers the heart rate.



The carotid sinus Is located at the superior border of the thyroid cartilage, medial to the sternocleidomastoid muscle.

4/15

A 19-Year-old girl presents to the ED with complaint of fever and non-painful pump on site of injury. She gives history of exposure to cats and scratch by young cats. Cat scratch disease is caused by which one of the following types of bacteria?

- A. Gram positive cocci
- B. Gram negative bacilli
- C. Gram positive bacilli
- D. Gram negative cocci
- E. Acid fast bacteria

Bartonella henselae: Gram negative bacilli or coccobacilli

Cat-scratch disease (CSD) or felinosis is an infectious disease caused by Bartonella henselae most often results from a scratch or bite of a cat.



How is aspirin beneficial in inhibiting platelets aggregation by blocking which of the following pathway?

A. Inhibition of platelet thromboxane A2 synthesis



B. Inhibition of binding of ADP to its platelet receptor

C. Inhibition of GPilb/Illa receptor sites

D. Inhibition of the breakdown of cAMP

E. Inhibition of the calcium release

Aspirin works as an antiplatelet agent by irreversibly blocking the enzyme cyclooxygenase-1 (COX-1) inside the platelets. This enzyme is necessary to generate thromboxane A2, a potent platelet activator from arachidonic acid. Aspirin also inhibits COX-2 which explains part of its anti-inflammatory properties.

Clopidogrel selectively inhibits the binding of adenosine diphosphate (ADP) to its platelet P2Y12 receptor, inhibiting the platelet adhesion and aggregation.

Abciximab binds to the glycoprotein (GP) IIb/IIIa receptor of platelets and inhibits platelet aggregation.



A 24-year-old man self presents to ED following a fight in a nearby street. He has sustained multiple stab wounds and laceration medial compartment of thigh. Which one of the following nerves is most likely injured in adductor canal?

A. Obturator nerve



B. Femoral nerve

C. Sciatic nerve

D. Saphenous nerve



E. Tibial nerve

The adductor canal serves as a passageway for structures moving between the anterior thigh and posterior leg.

It transmits the femoral artery, femoral vein (posterior to the artery), nerve to the vastus medialis and the saphenous nerve - the largest cutaneous branch of the femoral nerve.



You are required to perform procedural sedation in a patient who require ketamine. Which of the following are among the most common adverse effects associated with ketamine?

- A. Hyponatremia
- B. Hypotension
- C. Hyperkalemia
- D. Tachycardia
- E. Bradycardia

Ketamine is an anesthetic, used to induce loss of consciousness. Ketamine is NMDA receptor antagonist Psychosis and tachycardia are among the most common adverse events associated with ketamine.

Contraindications: Head trauma, Raised intracranial pressure and hypertension



What is the main mechanism of action of diltiazem?

- A. Blocks the Na+ channel
- B. Close the K+ channels
- C. Opens the Ca+ channels
- D. Opens the Na+channel
- E. Blocks Ca+ channels

Diltiazem and verapamil are non-dipyridamole calcium channel blocker

FDA-approved Indications of diltiazem

- Atrial arrhythmia, including atrial fibrillation with the rapid ventricular rate (RVR)
- Hypertension
- Paroxysmal supraventricular tachycardia
- Chronic stable angina
- Angina Due to Coronary Artery Spasm(Prinzmetal's angina)

Dihydropyridine calcium channel blockers include amlodipine, felodipine and nifedipine





A 43-year-old overweight patient presents to ED complaining of fever and severe right upper quadrant pain. The pain radiates to her right shoulder tip. Murphy's sign is positive and you diagnose acute cholecystitis. Which of the following nerves is responsible for the pain referred to as the shoulder tip?

- A. Greater thoracic splanchnic nerve
- B. Lesser thoracic splanchnic nerve
- C. Vagus nerve
- D. Phrenic nerve

E. Intercostal nerves

Motor innervation: The phrenic nerve provides motor innervation to the **diaphragm**; the main muscle of respiration.

Sensory Functions Sensory fibers from the phrenic nerve supply the central part of the diaphragm, including the surrounding **pleura** and **peritoneum**. The nerve also supplies sensation to the mediastinal pleura and the pericardium (Pain of pericarditis)

Note: Inflammation of gall bladder may present with pain in the right shoulder due to irritation of phrenic nerve (Diaphragmatic peritoneum).



A 49 years old deep sea driver having decompression sickness. Which one of the following laws demonstrate mechanism of dissolved gases in deep sea drivers?

A. Boyles law

B. Daltons law

C. Ficks law

D. Charles law

E. Henry law

Henry law states that the amount of dissolved gas in a liquid is proportional to its partial pressure above the liquid.

So, breathing gas at higher-than-normal pressures will cause their bodies to absorb more gases than are absorbed at lower pressures. Absorbed gases can cause decompression sickness as well as toxic effects.

• Henry law is applicable in Scuva diving (Recall) or deep-sea diver



A 19-year-old man attends the ED after sustaining a head injury. He has a facial nerve palsy and a CT sacn sacn shows a fracture of the temporal bone. His facial nerve has most likely been injured at which foramen of the skull base?

- A. Foramen Magnum
- B. Foramen lacerum
- C. Jugular foramen
- D. Stylomastoid foramen
- E. Foramen ovale

The facial nerve exits the cranial cavity through the **internal acoustic meatus (Recall)** and enters the facial canal of the temporal bone. The nerve then exits the skull through the Stylomastoid foramen (lie between the styloid and mastoid processes of the temporal bone) to enter the **parotid gland**, ultimately branching into five terminal branches to supply the face.

The facial nerve and its branches pass through the parotid gland, as does the external carotid artery, which gives off its two terminal branches, the maxillary artery and the superficial temporal artery,



inside the gland. Deep penetrating wound to the parotid gland will damage these vessels (Recall)

12 / 15

Whilst in your surgical rotation your consultant performs appendectomy. What is the most common site for the appendix found at appendicectomy?

- A. Pelvic
- B. Anterior to terminal ileum
- C. Retrocecal
- D. Below terminal ileum overlying psoas
- E. Retro-ileal

The most common position of the appendix overall is retrocecal, followed by pelvic type.

Note: Pus from ruptured appendix accumulate in right subphrenic space (Recall)



A 34-year-old presents to ER with severe right shoulder pain after a fall from a height. X-ray reveals a fracture in the middle third of the right clavicle. The medial end of the fractured clavicle is displaced upward due to traction by the?

- A. Rhomboid muscle
- B. Serratus anterior muscle
- C. Subclavius muscle
- D. Pectoralis minor muscle
- E. Sternocleidomastoid muscle



Clavicle acts to transmit forces from upper limb to axial skeleton.

After fracture:

- Lateral end is displaced inferiorly by the weight of the arm and displaced medially by the pectoralis major
- Medial end is pulled superiorly due to traction by the sternocleidomastoid muscle.



A 24-year-old man is stabbed in the abdomen with a kitchen knife. A CT demonstrates a diaphragmatic injury involving the esophageal hiatus.

Which structure is most likely to be damaged?

A. Inferior vena cava

B. Thoracic duct

C. Azygos vein

D. Vagus nerve

E. Aorta

Opening	<u>Vertebra level</u>	<u>Contents</u>
Esophageal opening	T-10 (Recall)	Esophagus, anterior and posterior vagal trunks
Aortic opening	T-12	Aorta, thoracic duct (RECALL), Azygous and hemiazygos vein
Caval opening	T-8	Inferior vena cava (RECALL), Right phrenic nerve (RECALL)



A 22-year-old professional marathon runner presents with shortness of breath. Which resting parameter would you expect to have a higher value when compared to an untrained patient?

A. Blood pressure

B. Oxygen consumption

C. Cardiac stroke volume

D. Heart rate

E. Cardiac output

Trained Athlete	Non- Athlete
Stroke volume at rest: 100ml Heart rate at rest: 50ml	Stroke volume at rest:70ml Heart rate at rest: 70ml
Stroke volume at maximal exercise: 160ml Heart rate at maximal exercise: 180ml	Stroke volume at: maximal exercise: 110ml Heart rate at maximal exercise: 190ml

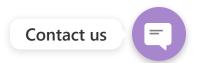
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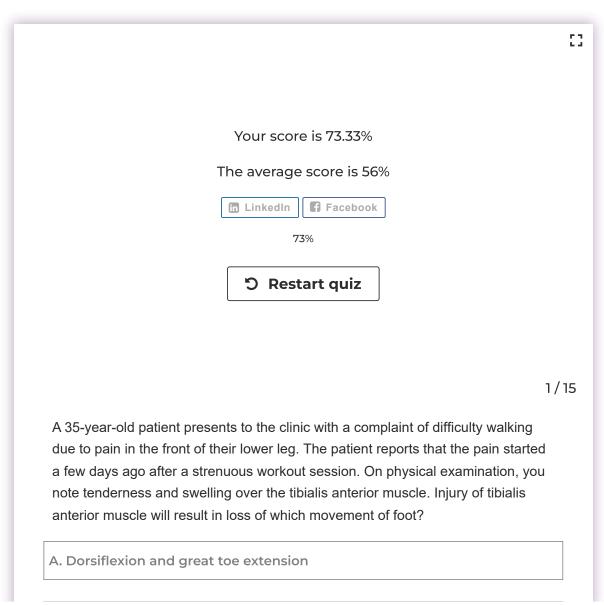


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About Lesson





B. Plantarflexion and inversion

C. Dorsiflexion and eversion

D. Dorsiflexion and inversion



E. Plantarflexion and eversion

Muscle	Attachment	Function	Innervation
Tibialis anterior	Origin: Lateral surface of tibia Insertion: Medial cuneiform and base of Metatarsal 1	Dorsiflexion and inversion of foot	Deep fibular nerve
Extensor hallucis longus	 Origin: Medial surface of fibular shaft Insertion: Distal phalanx of the great toe. 	Extension of great toe and dorsiflexion of foot	Deep fibular nerve
Extensor digitorum longus	Origin: Lateral condyle of tibia and medial surface of fibula Insertion: splits into 4 tendons inserts onto each toe	Extension of lateral four toes and dorsiflexion of foot	Deep fibular nerve
Fibularis tertius	Origin: Medial surface of fibular shaft Insertion: Fifth metatarsal	Dorsiflexion and eversion of foot	Deep fibular nerve

Anterior leg consists of four muscles

2/15

A 32-year-old male presents to the ED with complain of difficulty gripping objects in his right hand. On examination, he had a weak grip strength in his right hand and was unable to flex his index and middle fingers. However, he was able to flex his ring and little finger. Which one of the following nerves is most likely injured?



A. Brachial plexus

B. Musculocutaneous nerve

C. Radial nerve

D. Median nerve

E. Ulnar nerve

High yield median nerve injury

Lesion	Damaged at elbow	Damaged at wrist
Mechanisms	Supracondylar fracture of the humerus	Lacerations just proximal to flexor retinaculum
Motor Loss	The flexors and pronators in the forearm are paralyzed, with the exception of the flexor carpi ulnaris and medial half of flexor digitorum profundus. The forearm constantly supinated, and weak wrist flexion, Flexion, abduction and opposition of thumb is lost due to paralysis of thenar muscles and flexor digitorum profundus flexion of the index and middle fingers is lost due to paralysis of lateral two lumbricals	Paralysis of thenar muscles and lateral two- lumbricals. This affects opposition of the thumb and flexion of the index and middle fingers respectively
Sensory Loss	Lateral aspect of palm and palmar surface and fingertips of lateral three and a half digits	Palmar surface and fingertips of lateral three and a half digits
Signs	The thenar eminence is wasted, due to atrophy of the thenar muscles. If patient tries to make a fist, only the little and ring fingers can flex completely. This results in a characteristic shape of the hand, known as hand of benediction.	Thenar eminence wasting

Note: Flexion of the ring and little fingers at MCPJ and DIPJ are preserved as these are functions of medial half of flexor digitorum profundus and medial two lumbricals innervated by ulnar nerve

3/15

A 40-year-old male was playing basketball when he fell and landed on his right shoulder. He experienced immediate pain and had difficulty moving his arm. He was taken to the emergency room, where an X-ray showed that he had fractured the surgical neck of his right humerus. On examination he has loss of sensation



over inferior portion of deltoid. Which one of the following muscles is likely to be injured?

A. Supraspinatus

B. Subscapularis

C. Biceps Bracchi

D. Teres major

E. Teres minor 🎻

Axillary nerve injury is commonly caused by **fracture of surgical neck of humerus** or inferior dislocation of humerus.

- Causes weak lateral rotation and abduction of the arm. (Supraspinatus can abduct the arm but not to a horizontal level).
- Loss of sensation over the inferior portion of the deltoid (the 'regimental badge area').
- Quadrangular space: Axillary nerve and posterior circumflex humeral artery and vein pass through it and can be compressed as a result of trauma, muscle hypertrophy resulting in weakness of deltoid and teres minor.

4/15

A 35-year-old construction worker reports pain and swelling in the anatomical snuff box of his right hand after falling off a ladder and landing on his outstretched hand. You suspect injury of structures in anatomical snuff box. The medial border of the snuff box is formed by the tendon of which muscle?



A. Opponent pollicis

B. Extensor pollicis longus

C. Flexor pollicis longus

D. Flexor pollicis brevis

E. Abductor pollicis longus

Anatomical snuffbox

• is a triangular depression found on the lateral aspect of the dorsum of the hand. It is best seen when the thumb is extended.

Anatomical Boundaries	Structures
Medial border (Ulnar)	Tendon of extensor pollicis longus
Lateral border (Radial)	 Tendons of the abductor pollicis longus and extensor pollicis brevis
Proximal border	Styloid process of radius
Distal border	1st metacarpal
• Floor	Scaphoid and trapezium bones
• Roof	• Skin
• Contents	 Radial artery, terminal portion of the superficial branch of the radial nerve, cephalic vein

Clinical Pearl:

Fracture of scaphoid bone: Falling on outstretched hand. **The scaphoid** bone of the hand is the most commonly fractured carpal bone

Clinical feature: Pain and tenderness in the anatomical snuffbox.



A 65-year-old man with a history of hypertension and diabetes mellitus presents to the emergency room with sudden onset right-sided weakness and facial droop. Upon examination, the physician notes right-sided hemiparesis, dysarthria, and neglect of the left side of his body. The patient reports a severe headache and dizziness prior to the onset of his symptoms. Which one of the following vessels is most likely affected?

A. Anterior cerebral artery (ACA)

B. Middle cerebral artery (MCA)



C. Internal carotid artery (ICA)

D. Posterior cerebral artery (PCA)

E. Basilar artery

Based on the patient's symptoms, the most likely affected vessel is the Middle cerebral artery. The MCA supplies blood to the lateral surface of the brain, including the motor and sensory areas responsible for movement and sensation on the opposite side of the body. The patient's right-sided hemiparesis and neglect of the left side of his body are consistent with an MCA infarct

More easy to remember:

- ACA: Contralateral weakness in lower limb
- MCA: Contralateral weakness in face/arm greater than lower limb



Blood vessel	Clinical effects of occlusion of cerebral arteries	
Anterior cerebral artery	 <u>Frontal lobe</u>: contralateral weakness in lower limb, dysarthria, dysphasia, apraxia and urinary incontinence <u>Parietal lobe:</u> contralateral somatosensory loss in the lower limb 	
Posterior cerebral artery	 Occipital lobe: contralateral homonymous hemianopia with macular sparing, cortical blindness (if bilateral) Temporal lobe: memory deficit Occipitotemporal region: prosopagnosia, and color blindness 	
Middle cerebral artery	 Frontal lobe: contralateral weakness (face/arm greater than leg), conjugate deviation of the eyes to affected side, expressive dysphasia. Temporal lobe: deafness (if bilateral), receptive dysphasia, auditory illusions and hallucinations, contralateral superior quadrantanopia. Parietal lobe: loss of sensory discrimination, hemineglect, apraxia, contralateral inferior quadrantanopia (RECALL) 	

A 30-year-old farmer has sustained a deep laceration to the popliteal fossa. During examination your consultant ask what anatomical structure makes the upper lateral boundary of the popliteal fossa?

A. Tibial collateral ligament





B. Biceps femoris muscle

C. Lateral head of the gastrocnemius muscle

D. Popliteus muscle

E. Lateral epicondyle of the femur

Boundaries and contents of popliteal fossa

Superomedial border	Semimembranosus
Superolateral border	Biceps femoris
Inferomedial border	Medial head of gastrocnemius (Recall)
Inferolateral border	Lateral head of gastrocnemius and plantaris
Floor	The floor of the popliteal fossa is formed by the posterior surface of the knee joint capsule, popliteus muscle and posterior femur.
Roof	The roof is made of up two layers: popliteal fascia and skin. The popliteal fascia is continuous with the deep fascia of the leg.
Contents	Popliteal artery, popliteal vein, tibial nerve, common fibular nerve

7 / 15

A 27-year-old patient presents to the emergency department with a gluteal stab wound that he sustained during an altercation. The patient reports difficulty moving his right leg and is unable to flex his knee. On physical examination, you





note decreased sensation to light touch over the lateral aspect of his right leg and foot. Which one of the following nerves is most likely injured?

A. Common fibular nerve

B. Sural nerve

C. Obturator nerve

D. Saphenous nerve



E. Tibial nerve 🎻



Tibial nerve or posterior tibial nerve gives sensory innervation to posterolateral side of the leg, lateral side of the foot and heel (Plantar aspect of foot)

<u>Tibial nerve or Posterior tibial nerve</u>

Branch of sciatic nerve. Arises at apex of popliteal fossa receiving nerve fibers from L4-S3.

Functions:

- Motor: Innervates all the muscles in posterior compartment of the leg and the majority of the intrinsic foot muscles.
- **Sensory:** In the popliteal fossa, the tibial nerve gives off cutaneous branches. These combine with branches from the common fibular nerve to form the sural nerve. This sensory nerve innervates the skin of the posterolateral side of the leg and the lateral side of the foot and heel.

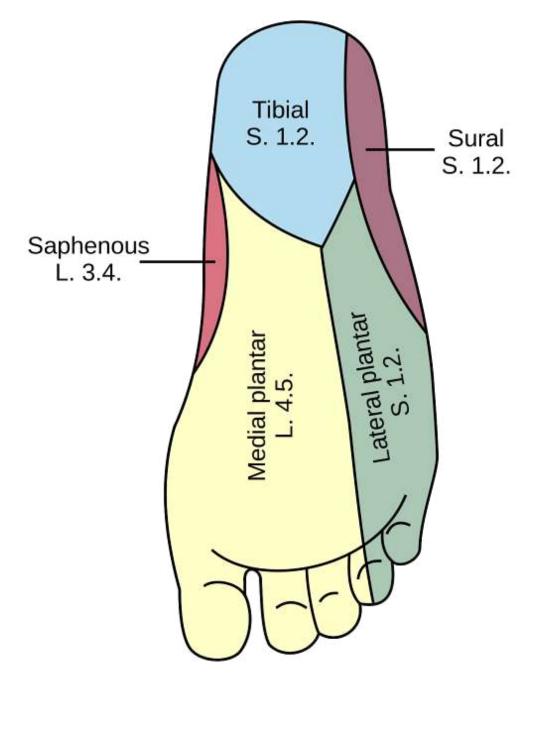
Note: In summary, the tibial nerve provides both motor and sensory innervation to the lower leg and foot, in this scenario patient unable to



flex his knee is because of tibial nerve injury while the sural nerve only provides sensory innervation to a small area of the lateral lower leg and foot.

 Also note sensory innervation specifically to Achilles tendon and plantar foot is because of tibial nerve and sensory innervation to lateral aspect of lower leg and lateral heel is because of sural nerve (Arises from both tibial and common fibular nerve)





An 18-year-old patient presents to the Emergency Department following an injury to the distal crease of her wrist. An image of her hand at rest is shown below. Paralysis to which of the following muscles is most likely responsible for this deformity?

A. Flexor digitorum profundus



- B. Extensor digitorum
- C. Interossei and medial two lumbricals
- D. Flexor digitorum longus
- E. Extensor digiti minimi

Interossei and medial two lumbricals are innervated by ulnar nerve

<u>Claw hand:</u> Injury to the ulnar nerve is commonly caused by a fracture of the medial epicondyle and results in a claw hand, in which the ring and little fingers are hyperextended at the metacarpophalangeal joints and flexed at the interphalangeal joints.

- Partial claw hand deformity is due to an isolated ulnar nerve injury.
- Complete claw hand deformity: Involves all digits and results from combined ulnar and median nerve injury.

Ulnar nerve injury at elbow and wrist



Lesion	At elbow	At wrist
Mechanism	Fracture of medial epicondyle	Laceration at wrist
Motor Loss	All the muscles of innervated by the ulnar nerve are affected. Flexion of the wrist can still occur, but is accompanied by abduction (due to paralysis of flexor carpi ulnaris and medial half of flexor digitorum profundus). Abduction and adduction of the fingers cannot occur (due to paralysis of the interossei). Movement of the 4th and 5th digits is impaired (due to paralysis of the medial two lumbricals and hypothenar muscles). Adduction of the thumb is impaired, and the patient will have a positive Froment's sign (due to paralysis of adductor pollicis).	Only the intrinsic muscles of the hand are affected. • Abduction and adduction of the fingers cannot occur (due to paralysis of the interossei). • Movement of the 4th and 5th digits is impaired (due to paralysis of the medial two lumbricals and hypothenar muscles). • Adduction of the thumb is impaired, and the patient will have a positive Froment's sign (due to paralysis of adductor pollicis).
Sensory Loss	Medial half of palm, palmar and dorsal surface of medial one and a half fingers and medial dorsum of hand	Palmar surface of medial one and a half fingers
Signs	Froment's sign	Claw hand Froment's sign

A 50-year-old patient named John has been admitted to the hospital with a hip fracture after a fall. He is scheduled to undergo surgery to repair the fracture the following day. The anesthesiologist has recommended a fascia iliaca block to manage his pain after the surgery. Which one of the following nerves is blocked by fascia iliaca rather than femoral block?

A. Lateral femoral cutaneous nerve of thigh



B. Femoral nerve

C. Sural nerve

D. Sciatic nerve

E. Saphenous nerve



Both the fascia iliaca block and the femoral block are regional anesthesia techniques used to manage pain in the lower extremities. The fascia iliaca block involves the injection of local anesthetic bupivacaine into the fascial compartment located deep to the inguinal ligament, targeting the femoral, lateral femoral cutaneous, and obturator nerves. This block provides analgesia to the hip joint, femur, and anterior thigh.

The femoral block, on the other hand, targets only the femoral nerve by injecting local anesthetic around the nerve at the level of the inguinal crease. This block provides analgesia to the anterior thigh and knee.

While both blocks can be effective in managing pain, the fascia iliaca block provides a broader area of analgesia and may be preferred for procedures involving the hip joint or for patients who have pain in the hip and thigh region. The femoral block may be preferred for procedures involving the anterior thigh or knee. The choice of block will depend on the specific needs of the patient and the nature of the procedure

10 / 15

A 55-year-old man with a history of hypertension and high cholesterol presents to the emergency room with complaints of chest pain and shortness of breath. Upon examination, the physician notes ST segment elevation in leads V4-V6 of the electrocardiogram. The patient is diagnosed with a myocardial infarction (MI) of the lateral wall of the heart. Further tests confirm the occlusion of which artery?

A. Right coronary artery (RCA)



B. Posterior descending artery (PDA)



C. Circumflex artery (LCX)



D. Left main coronary artery (LMCA)

E. Left anterior descending artery (LAD)

Easy to remember:

- Septal and Anterior wall MI: LAD (Anterior interventricular branch) occluded.
- Lateral wall MI: LCX occluded.

Cardiac blood supply:

1: The Right coronary artery supplies:

- The right atrium and most of right ventricle
- The sinoatrial and atrioventricular node
- Posterior interventricular artery, also known as the posterior descending artery (PDA), is a branch of the right coronary artery supply posterior 1/3 of interventricular septum and posterior aspect of right and left ventricle. Most common artery infracted in posterior wall MI

Note: Occlusion of right coronary artery can result into ischemia of SA and AV node and subsequently bradycardia or heart block

2: The left coronary artery supplies via main branches below:

- Anterior interventricular branch (LAD)
- LCX

Anterior interventricular branch	Right and left ventricles, anterior two- thirds of interventricular septum
Left circumflex branch.	Left atrium and left ventricle



A 32-year-old male presents to the ED with complain of difficulty gripping objects in his right hand. On examination, he had a weak grip strength in his right hand and was unable to flex his index and middle fingers accompanied by loss of opposition of thumb. Which one of the following nerves is most likely injured?

- A. Median nerve
- B. Musculocutaneous nerve
- C. Radial nerve
- D. Ulnar nerve
- E. Brachial plexus

Lesion	Damaged at elbow	Damaged at wrist
Mechanisms	Supracondylar fracture of the humerus	Lacerations just proximal to flexor retinaculum
Motor Loss	The flexors and pronators in the forearm are paralyzed, with the exception of the flexor carpi ulnaris and medial half of flexor digitorum profundus. The forearm constantly supinated, and weak wrist flexion, Flexion, abduction and opposition of thumb is lost due to paralysis of thenar muscles and flexor digitorum profundus flexion of the index and middle fingers is lost due to paralysis of lateral two lumbricals	Paralysis of thenar muscles and lateral two lumbricals. This affects opposition of the thumb and flexion of the index and middle fingers respectively
Sensory Loss	Lateral aspect of paim and palmar surface and fingertips of lateral three and a half digits	Palmar surface and fingertips of lateral three and a half digits
Signs	The thenar eminence is wasted, due to atrophy of the thenar muscles. If patient tries to make a fist, only the little and ring fingers can flex completely. This results in a characteristic shape of the hand, known as hand of benediction.	Thenar eminence wasting

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17-year-old male presented to the ED following road traffic accident. On examination, he had penetrating wound over Achilles' tendon, and she had loss of sensation over posterolateral distal leg and planter foot.



What nerve was injured in this injury?

A. Posterior tibial nerve



B. Sciatic nerve

C. Anterior-tibial nerve

D. Common fibular nerve

E. Sural nerve



Tibial nerve or posterior tibial nerve gives sensory innervation to posterolateral side of the leg, lateral side of the foot and heel (Plantar aspect of foot)

<u>Tibial nerve or Posterior tibial nerve</u>

Branch of sciatic nerve. Arises at apex of popliteal fossa receiving nerve fibers from L4-S3.

Functions:

Motor: Innervates all the muscles in posterior compartment of the leg and the majority of the intrinsic foot muscles.

Sensory: In the popliteal fossa, the tibial nerve gives off cutaneous branches. These combine with branches from the common fibular



nerve to form the sural nerve. This sensory nerve innervates the skin of the posterolateral side of the leg and the lateral side of the foot and heel.

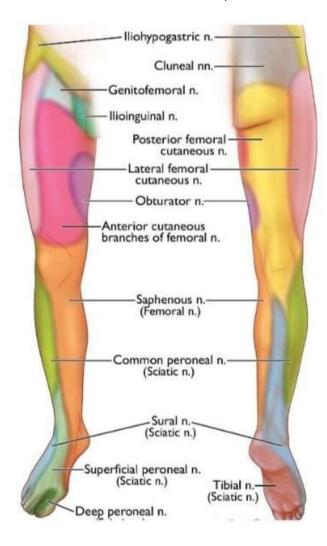
Sensory branches of tibial nerve:

Sural nerve	Tibial nerve, Common fibular nerve	Lower posterolateral leg, heel and lateral foot (Little toe)
Medial calcaneal nerve	Tibial nerve	Skin over the heel
Medial and lateral plantar nerves	Tibial nerve	Medial plantar: Innervates the plantar surface of the medial three and a half digits, and the associated sole area. Lateral plantar: lateral one and a half digits, and the associated sole area.

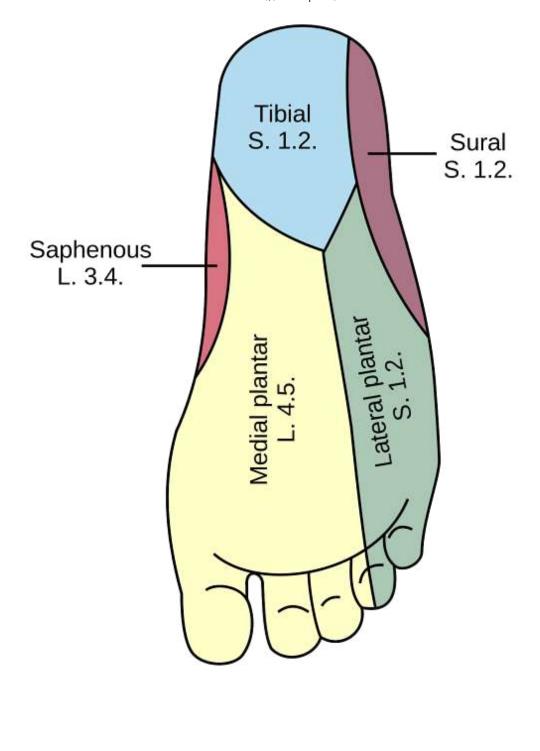
<u>Clinical pearls:</u> Damage to the tibial nerve causes loss of plantar flexion of the foot and impaired inversion. This presents difficulty in getting the heel off the ground and a shuffling gait, resulting in characteristic clawing of the toes and sensory loss on the sole of the foot, affecting posture and locomotion.

Note: The nerve block that is commonly used for pain management in heel injuries is the posterior tibial nerve block. **(RECALL)**









A 60-year-old man, fell down a flight of stairs and landed awkwardly on his left hip. He immediately felt a sharp pain in his hip and was unable to bear the weight on his left leg. He was taken to the emergency room, where X-rays revealed a fracture in his left femur and greater trochanter. Regarding greater trochanter of femur which one of the following muscles is inserted on it?

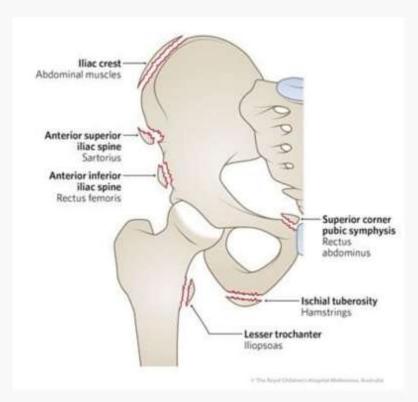
- A. Gluteus maximus
- B. Quadratus femoris
- C. Gluteus Medius
- D. Sartorius
- E. Tensor fasciae Latae

The greater trochanter of the femur serves as an attachment site for several muscles, including the gluteus medius and minimus, which are important for hip stability and movement. The gluteus medius attaches to the lateral surface of the greater trochanter and functions



to abduct and medially rotate the hip.

Origin of most important lower limb muscles



Note: Greater trochanter of femur is site of insertion of gluteus Medius, gluteus minims and piriformis (RECALL)



A 35-year-old patient who works as a mechanic presents with complaints of numbness and tingling in the ring finger and little finger of his right hand. On examination, you suspect that he may have ulnar nerve entrapment at Guyon's canal. Which one of the following carpal bone is most likely injured?

A. Hook of hamate
B. Capitate
C. Lunate
D. Scaphoid
E. Trapezoid

Fracture of both pisiform and hook of hamate can result into entrapment of ulnar nerve in Guyon's canal

<u>Ulnar canal (Guyon's canal)</u>

- Transmits ulnar neurovascular bundle from forearm into the hand. **Borders:**
- Medial (ulnar): pisiform, flexor carpi ulnaris tendon
- Lateral (radial): hook of hamate.
- Roof: palmar carpal ligament.
- Floor: flexor retinaculum

Contents: Ulnar nerve and artery **Clinical Pearl:**



• Ulnar canal syndrome refers to compression of the ulnar nerve within the ulnar canal.

15 / 15

A 27-year-old runner is out for her morning jog when she steps on a rock and her left foot suddenly twists inward and she also sustained a lateral malleolus tear. Which one of the following ligaments is commonly torn in this injury?

A. Calcaneofibular ligament (CFL)

B. Anterior talofibular ligament (ATFL)



C. Syndesmotic ligament

D. Posterior talofibular ligament (PTFL)

E. Deltoid ligament

Inversion injury along with tear of lateral malleolus, tear of ATFL > CFL> PTFL

<u> Ankle ligaments</u>

- <u>Eversion injury</u> = medial ligament or medial deltoid ligament injury associated with tear of medial malleolus most commonly
- <u>inversion injury</u>= Lateral collateral ligament injured (subdivided into 3 ligaments) most frequent ligament injury during ankle sprain or inversion injury commonly affected ligament is Anterior talofibular ligament followed by calcaneofibular ligament (both are ligaments of lateral collateral ligament) associated with tear of lateral malleolus most commonly

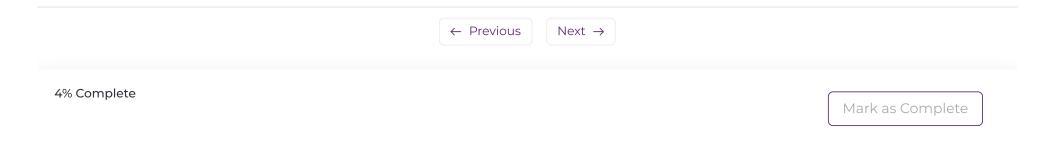
• Least injured during inversion injury post talofibular ligament

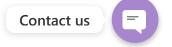




QUIZ: 27 | MRCEM EXPERT

The spring ligament (plantar calcaneonavicular ligament) is a broad thick ligament that extends from the calcaneus to the navicular bone. It supports the head of the talus, maintaining the stability of the talocalcaneonavicular joint and resists depression of the medial arch of the foot. The spring ligament takes the weight of the body from the talus and transmits it to the forefoot.





QUIZ : 28 | MRCEM EXPERT

← Mrcem Primary Complete Course ,High Yield Stuff and Similar to Previous Exam Questions With Explanation (For Diet 2)

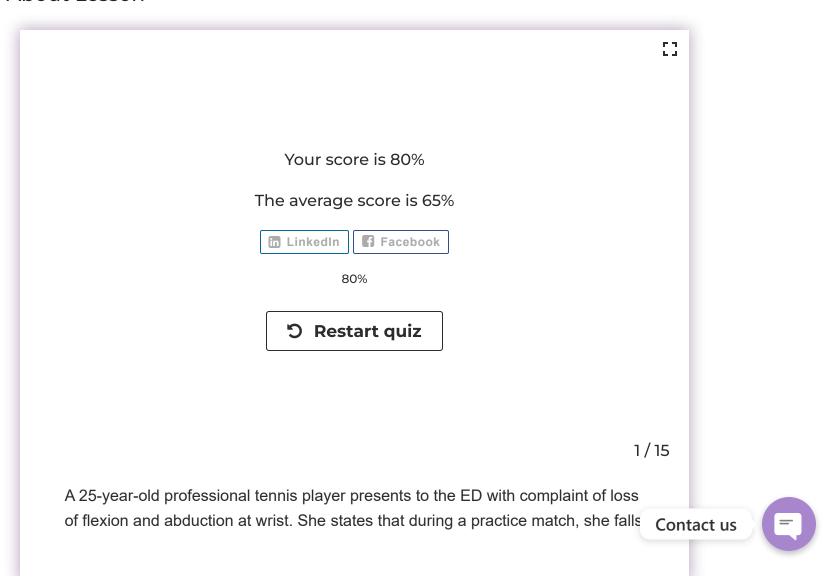


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and injures her wrist. Which one of the following forearm muscles is likely to be injured?

- A. Extensor digitorum muscle
- B. Pronator teres muscle
- C. Flexor carpi radialis muscle
- D. Flexor carpi ulnaris muscle
- E. Extensor carpi radialis muscle
- Flexor carpi radialis muscle= Flexion and abduction at wrist
- Flexion carpi ulnaris muscle= Flexion and adduction at wrist

Forearm muscles

Anterior forearm muscles superficial compartment



Muscle	Function	Innervation
Flexor carpi ulnaris	Flexion and adduction at wrist	Ulnar nerve
Palmaris longus	Flexion at wrist	Median nerve
Flexor carpi radialis	Flexion and abduction at wrist	Median nerve
Pronator teres	Pronation of the forearm	Median nerve

A 35-year-old lady brought into the ED with history of RTA. She has fractured right femur with significant blood loss and in state of shock. What is the mechanism involving her presentation of shock?

- A. Parasympathetic activation
- B. Sympathetic activation
- C. Parasympathetic inhibition



D. Cushing reaction



E. Sympathetic inhibition

In response to hypovolemia, the body tries to compensate by activating the sympathetic nervous system. This leads to an increase in heart rate, vasoconstriction (narrowing of blood vessels), and the release of hormones such as adrenaline and norepinephrine. These responses are intended to maintain blood flow to vital organs such as the brain and heart, but they can also cause peripheral vasoconstriction, reduced blood flow to non-vital organs, and decreased urine output. If the blood loss continues, the body's compensatory mechanisms may become overwhelmed, and shock can occur.

3 / 15

A 35-year-old female patient presents to the emergency department with palpitations. An electrocardiogram (ECG) reveals that she is experiencing supraventricular tachycardia (SVT). You plan to give her adenosine. What is the mechanism of action of adenosine on the heart when given in SVT?

- A. Adenosine activates the parasympathetic nervous system
- B. Adenosine inhibits the sympathetic nervous system
- C. Adenosine dilates the coronary arteries

Contact us



D. Adenosine slows the conduction through the AV node

E. Adenosine increases the heart rate

Adenosine stimulates A1-adenosine receptors and opens acetylcholine sensitive K+ channels, increasing K+ efflux. This hyperpolarises the cell membrane in the atrioventricular node and, by inhibiting the calcium channels, slows conduction in the AVN. As it has a very short duration of action (half-life only about 8 - 10 seconds)

Contraindications:

Adenosine is contraindicated in: Asthma and COPD (can cause bronchospasm), Decompensated heart failure, Long QT syndrome, Second- or third-degree AV block and sick sinus syndrome (unless pacemaker fitted) and Severe hypotension

4/15

A motorcyclist falls from his bike in an accident and gets a deep gash that severs the superficial peroneal nerve near its origin. Which of the following muscles is paralyzed?

A. Fibularis longus



B. Extensor digitorum longus

C. Fibularis tertius



D. Extensor hallucis longus

E. Extensor digitorum brevis

Muscles in the Lateral compartment of leg:

Consists of two muscles, fibularis longus and brevis, also called peroneus longus and peroneus brevis.

Muscle	Attachment	Function	Innervation
Fibularis longus	 Origin: superior and lateral surface of the fibula Insertion: 1st metatarsal and medial cuneiform 	 Eversion and plantarflexion of foot Support lateral arch as well as transverse arch of foot 	Superficial fibular nerve
Fibularis brevis	 Origin: Inferolateral surface of fibular shaft Insertion:5th metatarsal 	Eversion of foot	 Superficial fibular nerve

Note: Insertion of fibularis longus is 1st metatarsal and medial cuneiform (Recall)

• Insertion of fibularis brevis is 5th metatarsal (Recall)

A 15-year-old boy presents to the emergency department with a history of fever, headache, and swollen and painful salivary glands for the past week. He reports having difficulty eating and drinking due to the pain in his glands. He also complains of easy bruising, petechiae, and gum bleeding for the past few days. On examination, his platelet count is found to be decreased, and he is noted to have acute kidney injury. Based on clinical presentation what is the likely diagnosis?

A. Idiopathic thrombocytopenic purpura (ITP)



B. Systemic lupus erythematosus (SLE)

C. Infectious mononucleosis (IM)

D. TTP

E. Henoch-Schönlein purpura (HSP)





Immune Thrombocytopenic Purpura or idiopathic	Thrombotic Thrombocytopaenic Purpura	
 Acute ITP is most common in children. In approximately 75% of cases, the episode follows vaccination or infection such as chicken pox or glandular fever Chronic ITP: More prevalent in adults Female to male ratio 3:1 More likely to have underlying autoimmune disease. Example: In patients with thrombocytopaenia, normal haemoglobin, white cell counts, and normal coagulation tests (PT, APTT and fibrinogen) most likely go with ITP 	 TTP has traditionally been described as a pentad of Thrombocytopaenia Microangiopathic haemolytic anaemia Neurological abnormalities Renal failure Fever Laboratory Findings: Normal PT/APTT and fibrinogen Decreased platelets 	

Note: HSP can also present with similar symptoms. HSP is a systemic vasculitis that affects small blood vessels and is characterized by the deposition of immune complexes in the vessel walls. It primarily affects children and is characterized by a triad of symptoms including palpable purpura (red or purple spots on the skin), arthritis, and abdominal pain. HSP can also cause renal involvement and hematuria.

If in question stem mentioned abdominal pain, arthritis and renal involvement go with HSP.

6/15

Which one of the following hormones is involved in secretion of bile?





QUIZ : 28 MIRCEM EXPERT	
B. Glucagon	
C. GIP	
D. Motilin	
E. Somatostatin	
 Bile production is stimulated by: Bile salts, Secretin, glucagon and gastrin Bile secretion/ release of bile is stimulated by CCK 	
Note: For details check bile and bile salts in gastrointestinal physiology.	
	7 / 15
You are called to attend to a patient with blood glucose of 2.0 mmol/L. He is conscious and alert. What is the most appropriate initial treatment?	
A. Intravenous 10% glucose infusion at rate of 100 ml/h	
B. 15-20 g glucose orally	
C. 1 mg intramuscular glucagon	

D. Intravenous 20% glucose infusion at rate of 100 ml/hr



E. 1 mg subcutaneous glucagon

- In adults who are conscious, cooperative and can swallow: Give 15 20 g quick acting carbohydrate of the patient's choice where possible e.g., 90 120 mL of Lucozade or 5-7 Dextrosol tablets Repeat capillary blood glucose 10 15 minutes later. If blood glucose is still < 4.0 mmol/L, repeat step 1 (no more than 3 treatments in total) If blood glucose remains < 4.0 mmol/L after 45 minutes or 3 cycles, consider 1 mg glucagon IM OR IV 10% glucose infusion at 100ml/hr
- Note: If the patient is unconscious and no iv line is accessed first choice would be im glucagon and in question iv line accessed then choose IV 10% glucose.

8/15

A mother brought his five years old son into the ED with a complaint of hematemesis after swallowing a button battery. CT scan shows its stuck at T10. Which vessel has been damaged and bleeding?

A. Left gastric artery



B. Inferior mesenteric artery

C. Splenic artery

D. Right gastric artery



E. Gastroduodenal artery

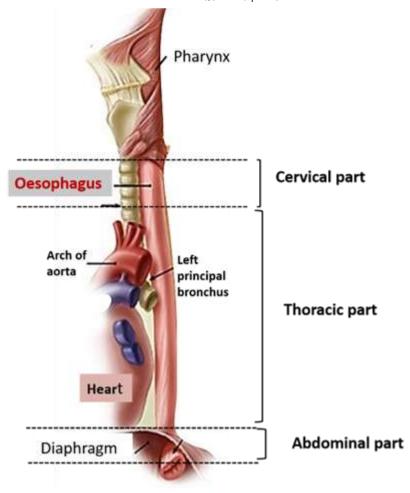
When a button battery is swallowed and becomes lodged in the esophagus or stomach, it can erode through the tissue and cause a perforation or fistula to form. In children, this is most seen at the site of the left gastroesophageal junction, which is the point where the esophagus meets the stomach on the left side. The left gastric artery is a branch of the celiac artery that supplies blood to the stomach and is located in this area. If the battery erodes through the tissue and into the left gastric artery, it can cause life-threatening bleeding.

Oesophageal constrictions

The anatomical relations of the oesophagus give rise to four **constrictions, where** food/foreign objects are most likely to become impacted.

Oesophageal constrictions should not be confused with pathological constrictions.

- Cervical constriction: due to cricoid cartilage at the level of C5/6
- Thoracic constriction: due to aortic arch at the level of T4/5
- Abdominal constriction: at oesophageal hiatus at T10/11 vertebral



High yield:

Peptic ulcer:

- Bleeding gastric ulcer = Left gastric artery (Recall)
- Bleeding duodenal ulcer = Gastroduodenal artery (Recall)



A 45-year-old male patient presents to the emergency department with shortness of breath (SOB) and a normal alveolar-arterial (A-a) gradient. Regarding (A-a) gradient which one of the following diseases can present with it?

B. Pneumonia

C. COPD

D. Pulmonary emboli

E. Myasthenia gravis



A-a gradient

Difference between alveolar Po2 and arterial Po2

- A-a gradient: PA02-Pao2 (where PA02 alveolar po2 and Pao2 is arterial po2)
- The A-a gradient is used to determine whether O2 has equilibrated between alveolar gas and arterial blood and helps determine causes of hypoxemia.
- The normal A-a gradient is between 0- and 10mm Hg. Since O2 normally equilibrates between alveolar gas and arterial blood, PAo2 is



approximately equal to Pao2. g., Hypoventilation: CNS depression, neuromuscular disease (including myasthenia gravis and kyphoscoliosis), Obesity and Low inspired fio2 on high altitude

• The A-a gradient is increased (>10 mm Hg) if O2 does not equilibrate between alveolar gas and arterial blood (e.g., diffusion defect, V/Q defect, and right-to-left shunt) and PAo2 is greater than Pao2

10 / 15

You have been asked to give a teaching session on head injuries to a group of medical students. You are discussing cerebral blood flow and the relation with intracranial pressure. Which of the following statements is true regarding. cerebral blood flow (CBF), cerebral perfusion pressure (CPP), and intracranial pressure (ICP)?

- A. Normal ICP is 65 to 195 mmHg.
- B. CPP closely parallels diastolic blood pressure
- C. CBF autoregulation is lost below a CPP of 60 mmHg.



- D. The only resistance to CBF is ICP
- E. CPP means arterial pressure (MAP) ICP



• Cerebral perfusion pressure (CPP) is the pressure gradient that drives blood flow through the brain. It is defined as the difference between the Contact us





mean arterial pressure (MAP) and the intracranial pressure (ICP) and is represented by the following formula: CPP = MAP - ICP.

• Normal ICP ranges from 5 to 15 mmHg. The statement "Normal ICP is 65 to 195 mmHg" is incorrect and represents a severe elevation of ICP that could cause brain damage.

11 / 15

A 55-year-old man is admitted to the emergency department with acute respiratory distress. His oxygen saturation is low, and he is struggling to breathe. The medical team determines that the patient requires intubation to secure his airway and provide mechanical ventilation. Before intubation, the team prepares to preoxygenate the patient to minimize the risk of hypoxemia during the procedure. Regarding preoxygenation for intubation, which lung volume needs to be replaced with oxygen?

- A. Expiratory reserve volume (ERV)
- B. Functional residual capacity (FRC)



- C. Inspiratory reserve volume (IRV)
- D. Total lung capacity (TLC)
- E. Residual volume (RV)

During preoxygenation for intubation, the functional residual capacity (FRC) of the lungs needs to be replaced with oxygen. The FRC is the



volume of air that remains in the lungs at the end of a normal exhalation. During preoxygenation, the goal is to fill the patient's lungs with oxygen-rich air to increase the amount of oxygen available in the body before intubation and to prevent hypoxemia (low oxygen levels in the blood) during the procedure.

By taking deep breaths and exhaling slowly, the patient can increase the amount of air they have in their lungs at end-expiration, which maximizes the FRC. When the patient is breathing 100% oxygen, this oxygen-rich air replaces the air in the lungs and maximizes the oxygen reservoir available for the patient. Replacing the FRC with oxygen ensures that the patient has adequate oxygen reserves to prevent hypoxemia and allow for safe intubation

12 / 15

A 60-year-old diabetic patient presents to the ED with complaints of increased thirst, frequent urination, and fatigue. Lab results reveal elevated blood glucose levels and the presence of glucose in the patient's urine. Which part of the kidney reabsorbs maximal glucose?

A. Loop of Henle

B. Distal convoluted tubule

C. Collecting duct

D.: Renal papilla



E. Proximal convoluted tubule



Maximal glucose reabsorption occurs in proximal convoluted tubule.

13 / 15

A 45-year-old electrician presents to the ED with complaint of unable to abduct his little finger on his left hand. He tries to move it but finds that the muscle on the side of his palm, known as the hypothenar eminence, is no longer functioning properly. Which one of the following hypothenar muscles is likely injured?

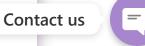
- A. Flexor digiti minimi muscle
- B. Adductor pollicis muscle
- C. Opponens digiti minimi muscle
- D. Abductor digiti minimi muscle



E. Palmaris brevis muscle

Muscles of the hand: Hypothenar muscles:

Hypothenar muscle located at base of middle finger and form hypothenar eminence. All are innervated by ulnar nerve



Opponens digiti minimi	Rotates little finger produces opposition	Ulnar nerve
Abductor digiti minimi	Abducts little finger at MCPJ	Ulnar nerve
Flexor digiti minimi brevis	Flexes little finger at MCPJ	Ulnar nerve

Thenar muscles:

Three short muscles located in the base of the thumb. All are innervated by median nerve.

Opponens pollicis	Opposes thumb by medially rotating and flexing thumb	Median nerve
Abductor pollicis brevis	Abducts thumb at MCPJ	Median nerve
Flexor pollicis brevis	Flexes thumb at MCPJ	Median nerve

14 / 15

A 40-year-old diabetic patient is brought to the emergency department with symptoms of hypoglycemia, including sweating, confusion, and lethargy. The team administers a dose of glucagon to the patient to help raise their blood glucose levels and his symptoms resolved. What is the action of glucagon in hypoglycemia?

A. Glycogenesis

B. Inhibition of insulin secretion

C. Glycogenolysis

D. Glucogenolysis



E. Gluconeogenesis

Glucagon acts by binding to specific receptors on liver cells (Recall), which activates an enzyme called glycogen phosphorylase. This enzyme catalyzes the breakdown of glycogen into glucose, which is then released into the bloodstream. In the case of hypoglycemia, glucagon stimulates the liver to break down its stored glycogen and release glucose into the bloodstream, which helps to raise the patient's blood sugar levels.

15 / 15

A 50-year-old female presents to the emergency department with severe abdominal pain that has been worsening for the past few days. The patient reports that the pain is located in the upper right quadrant of her abdomen and is accompanied by nausea and vomiting. Imaging studies reveal the presence of gallstones in the patient's gallbladder. What hormone is responsible for the patient's gallstone-associated pain?

A. CCK

B. Gastrin

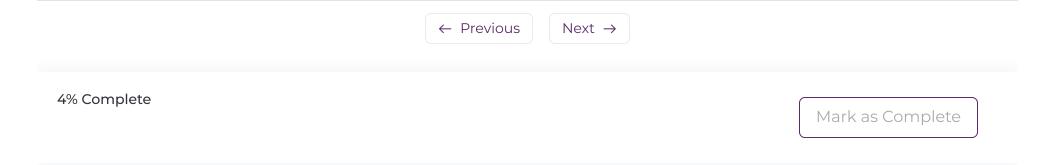
C. Somatostatin

D. Glucagon



E. Secretin

The hormone responsible for gallstone-associated pain is cholecystokinin (CCK). CCK is released from the intestinal cells in response to the presence of fatty acids and amino acids in the duodenum. It stimulates the contraction of the gallbladder, leading to the release of bile into the duodenum. In patients with gallstones, the contraction of the gallbladder can cause intense pain as the stones are forced through the narrow bile ducts. The pain typically occurs after a meal when CCK levels are highest.



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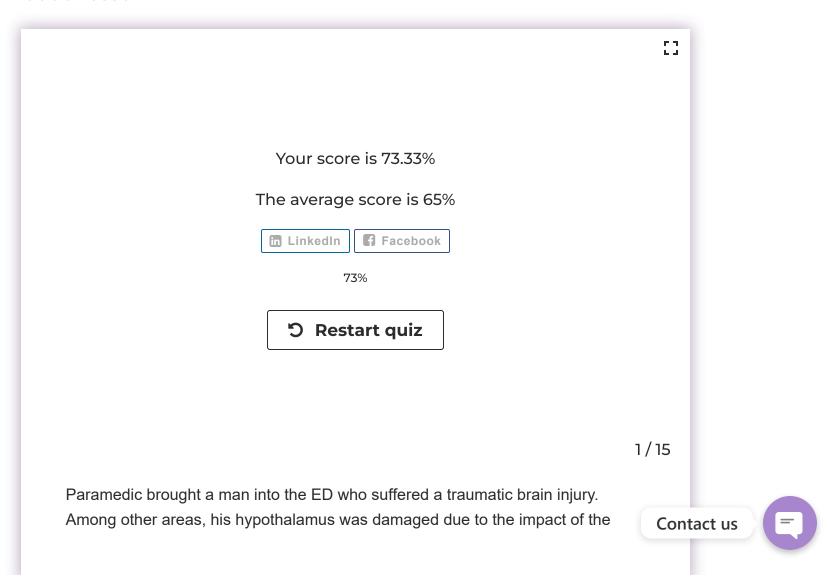
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Overview •

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About Lesson



collision. Hypothalamic injury leads to increase in which one of the following hormones?

A. FSH	
B. TSH	
C. Prolactin	
•	
•	
D. ACTH	

- An Injury to the hypothalamus can cause an increase in prolactin levels. Prolactin is a hormone that is primarily produced by the pituitary gland, but its release is controlled by the hypothalamus.
- The hypothalamus produces a hormone called dopamine, which inhibits the release of prolactin from the pituitary gland. If the hypothalamus is injured, it may not produce enough dopamine, leading to an increase in prolactin levels. This condition is known as hyperprolactinemia, and it can cause a range of symptoms, including irregular periods, breast milk production (even in non-pregnant or non-nursing women), decreased sex drive, and erectile dysfunction in men. In severe cases, it can also cause infertility and osteoporosis.



During a routine physical examination, you perform auscultation of the heart to listen to the sounds produced by the valves. What is the area of auscultation of aortic valve?

A. Second right intercostal space



B. Right 5th intercostal space

C. Apex of heart

D. Second left intercostal space

E. Left 5th intercostal space

<u>High yield:</u>

Areas of auscultation of heart. Remember on fingertips.

Aortic valve	Second right intercostal space
Pulmonary valve	Second, left intercostal space
Tricuspid valve	5th intercostal space to the lower left sternal border
Mitral valve	Apex, Left 5th ICS in midclavicular line



A 60-year-old male with a history of hypertension and smoking presents to the emergency department with chest pain. An ECG shows ST-segment elevation in the inferior leads, and a diagnosis of acute myocardial infarction (MI) is made. The infarcted tissue in the heart is likely to undergo which type of necrosis?

Α.	LIa	ueta	ctive	necr	OSIS

R	Coadu	lativa	necrosis	
о.	Coagu	iative	necrosis	

C. Caseous necrosis

D. Fibrinoid necrosis

E. Fat necrosis

Cell death:

High yield: Be familiar with all types and examples.



11/5/23, 3:21 PM QUIZ : 29 | MRCEM EXPERT

Necrosis	Apoptosis
Cell death along with degradation of tissue by hydrolytic enzymes Causes: Hypoxia and toxins Morphology: i) inflammatory reaction always present i) Death of many adjacent cells ii) Cell swelling initially iv) Membrane disruption v) Damaged organelles vi) Nuclear disruption vii) Phagocytosis of cell debris by macrophages Types: Coagulative necrosis: Most common type -Affect all organs except brain -Heart most commonly affected Liquefactive necrosis: Most common suppurative infarctions -Brain infarction Fat necrosis occur in acute pancreatitis Fibrinoid necrosis: Seen in immune mediated disease -Polyarteritis nodosa -Malignant hypertension -SLE Caseous necrosis: Characteristic of tuberculosis	Programmed and coordinated cell death Causes: Physiologic or pathologic processes Morphology: i) No Inflammatory reaction ii) Death of single cells iii) Cell shrinkage iv) Cytoplasmic blebs on membrane v) Apoptotic bodies vi) Chromatic Condensation Vii) phagocytosis of apoptotic bodies by macrophages Example: Tumor regress in size due to apoptosis •Endometrial shedding •Regression of lactating breast after weaning •Pathologic conditions include DNA damage due to radiation, hormonal therapy and cytotoxic anticancer drugs

4/15

A 35-year-old woman presents to the emergency department with sudden onset of severe lower back pain and numbness in both legs. She reports difficulty with walking and standing up from a seated position. Upon further evaluation, the healthcare provider notes decreased sensation in the saddle area and decreased anal tone, suggestive of possible cauda equina syndrome. Regarding anatomy of cauda equina lies at which vertebral level?



A. C3-C5

B. S3-S5

C. C5-C6

D. T12-S2

E. T12-L1

- The spinal cord is housed in the vertebral canal. It is continuation of medulla oblongata and terminates as the conus medullaris at the second lumbar vertebrae of adults.
- At birth, the conus medullaris lies at L3. By the age of 21, it sits at L1/L2, thus the spinal cord only occupies about 2/3s of the space available to it in the vertebral canal.
- Below the conus medullaris is cauda equina which lies below L1 from L2 to sacrum

Note: The cauda equina contains a bundle of nerves which project distally within the enclosed cavity of the lumbar cistern from the spinal cord and conus medullaris toward the coccyx. Each nerve exits at its respective vertebral level toward targets which are supplied by the L2-S5 spinal cord level.

In patients with chronic kidney disease, which part of the kidney is primarily targeted by parathyroid hormone (PTH) to regulate calcium and phosphorus homeostasis?

A. Collecting duct

B. Proximal convoluted tubule



C. Glomerulus

D. Distal convoluted tubule



E. Loop of Henle

- PTH increases Ca reabsorption by activating adenylate cyclase in the distal tubule.
- Thiazide diuretics increase Ca reabsorption in the early distal tubule and therefore decrease Ca excretion. For this reason, thiazides are used in the treatment of idiopathic hypercalciuria.

High yield: Renal calcium handling

Contact us



• 60% of plasma Ca is filtered across the glomerular capillaries.

- Together the proximal tubule and thick ascending limb reabsorb more than 90% of filtered Ca by passive processes that are coupled to Na reabsorption.
- Loop diuretics (furosemide) cause increased urinary calcium excretion (hypercalciuria). Because Ca reabsorption is linked to Na reabsorption in LOH, inhibiting Na reabsorption with a loop diuretic also inhibits Ca reabsorption. If volume is replaced, loop diuretics can be used in the treatment of hypercalcemia.
- Together, distal tubule and collecting duct reabsorbs 8% of filtered Ca by an active process.
- PTH increases Ca reabsorption by activating adenylate cyclase in the distal tubule.
- Thiazide diuretics increase Ca reabsorption in the early distal tubule and therefore decrease Ca excretion. For this reason, thiazides are used in the treatment of idiopathic hypercalciuria.

Which part of the intestine becomes distended to trigger the opening of the ileocecal valve, allowing the contents of the small intestine to pass into the large intestine?

A. Ileum

B. Cecum

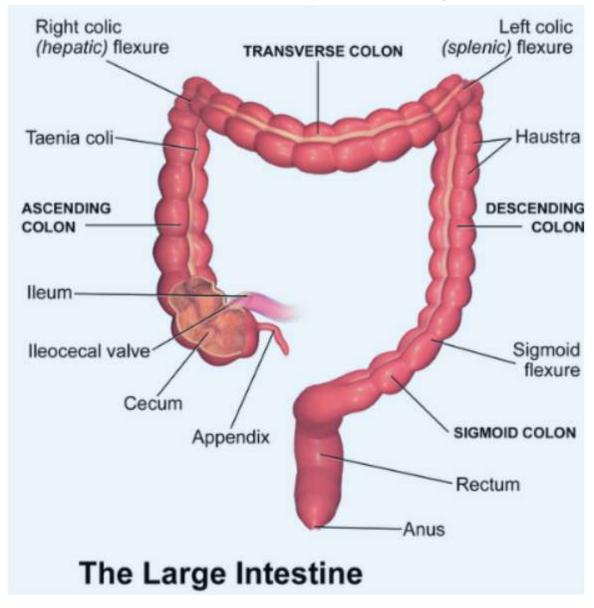
C. Appendix

D. Duodenum

E. Jejunum

The ileocecal valve is located at the junction of the ileum (last part of the small intestine) and the cecum (first part of the large intestine). When the ileum becomes distended, due to the accumulation of digested food, it triggers the opening of the ileocecal valve, allowing

the contents of the small intestine to pass into the large intestine



A 28-year-old male patient with history of severe allergy to peanuts accidentally ingests some food containing peanuts. Within minutes, he developed difficulty breathing, swelling of the face and throat, and hives. You suspect anaphylaxis and one dose of adrenaline was given. Which of the following receptors does adrenaline act on during anaphylaxis?

- A. Dopamine receptors
- B. Beta-1 adrenergic receptors
- C. Beta-2 adrenergic receptors
- D. Alpha 2 adrenergic receptors
- E. Alpha-1 adrenergic receptors



Adrenaline acts on beta-2 adrenergic receptors, which are found in the lungs, heart, and blood vessels. Stimulation of beta-2 adrenergic receptors causes relaxation of bronchial smooth muscle, increased cardiac output, and vasodilation, which can help to counteract the effects of anaphylaxis.



A 6o years old lady was brought into the ED with fracture of right hip. Which of the following is the primary cause of postmenopausal fractures?

- A. Increased estrogen production
- B. Excessive physical activity
- C. Increased bone density
- D. Decreased estrogen production



E. Increased bone strength

Postmenopausal fractures are often caused by osteoporosis, which is a condition characterized by decreased bone density and increased bone fragility. During menopause, there is a decrease in estrogen production, which can lead to accelerated bone loss and increased risk of fractures. Other factors that can contribute to postmenopausal fractures include age, genetics, nutrition, physical inactivity, smoking, and certain medical conditions or medications that can affect bone health.

Note: Choose hormonal imbalance option if question stem is different from this and no other character of osteoporosis is matched in options.



A 25-year-old male presents to the ED with complaint of left upper quadrant pain, which structure prevent diffuse peritonitis across abdomen?

A. Greater omentum
B. Cecum
C. Sigmoid colon
D. Hepatogastric ligament
E. Small intestinal mesentery

Omentum

- Peritoneal fold extending from the stomach to adjacent neurovascular structures divided into the greater and lesser omentum
- The greater omentum is a fatty apron that hangs down from the greater curvature of the stomach, and it plays a role in the immune response to infections and inflammation in the abdomen. The greater omentum is known to have a protective function in the peritoneal cavity, where it can limit the spread of infection or inflammation to other parts of the abdomen and help isolate the affected area.
- Therefore, if diffuse peritonitis is suspected due to a perforation in the LUQ, the greater omentum may play a role in containing the spread of



the infection or inflammation and preventing it from becoming more widespread in the peritoneal cavity.

Greater omentum	Descends from greater curvature of stomach and first part of duodenum, covers inferiorly over transverse colon, jejunum and ileum. Transmits right and left gastroepiploic vessels. Wraps and adheres around inflamed abdominal organs thus preventing diffuse peritonitis.
Lesser omentum	Double layer of peritoneum extending from the porta hepatis of the liver to the lesser curvature of the stomach and the beginning of the duodenum. Lesser curvature of the stomach contains the proper hepatic artery, bile duct, and portal vein within its right

10 / 15

Which one of the following feedback mechanisms is involved in the release of oxytocin from the posterior gland during childbirth and labor?

- A. Neutral feedback mechanism
- B. Direct feedback mechanism
- C. Positive feedback mechanism
- D. Indirect feedback mechanism

E. Negative feedback mechanism



Positive feedback:

Promotes changes in one direction leading amplified effect. Cause vicious cycle and death, sometimes it can be useful.

Examples:

- Childbirth (During labor): The release of oxytocin from the posterior gland during childbirth and labor
- Blood clotting.
- Generation of nerve signals.
- Sensation of needing to urinate.
- Follicular phase of menstrual cycle

Negative feedback:

- Components: Regulated variable, Sensor, Controller, and Effector.
- A regulated variable is sensed, information is fed back to the controller, and the effector acts to oppose change (hence the term negative)
 Control most systems of body."
- Examples: Osmoregulation, regulation of blood, pressure, temperature regulation, regulation of CO2 in ECF.

11 / 15

A 26-year-old male brought into the ED by paramedics with lacerated wound on left upper quadrant. You suspect splenic injury. Which rib fracture is likely to be associated with spleen injury?

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A. Rib 4

https://mrcemexpert.com/courses/mrcem-primary-complete-course-diet2/lesson/quiz-29-4/

B. Rib 6

C. Rib 1

D. Rib 8

E. Rib 10 귒

Spleen injury most Likely associated with fracture of rib 10.

Rib Location	Associated Injury Sites
Rib 1	Subclavian vessel
Ribs 1-3	Vascular, brachial plexus
Ribs 4-9	Pulmonary, cardiovascular
Ribs 9–12	Liver (right ribs), spleen (left ribs)

12 / 15

Which of the following best describes the mechanism of action of botulinum toxin?

A. It blocks the release of acetylcholine, leading to muscle paralysis





B. It promotes the production of acetylcholine, causing sustained muscle contraction.

C. It inhibits the breakdown of acetylcholine, prolonging muscle contraction.

D. It binds to acetylcholine receptors on muscle cells, preventing muscle relaxation.

E. It enhances the release of acetylcholine, leading to increased muscle contraction

Botulinum toxin blocks the release of acetylcholine from nerve endings at the neuromuscular junction (Recall), leading to muscle paralysis.

13 / 15

A 47-year-old gardener has accidentally stabbed his right foot with a garden fork while working in sandals. He tells you that he had a full course of vaccinations as a child. wound is contaminated with manure. What would you advise him regarding tetanus prophylaxis?

A. He should have a tetanus booster and human tetanus immunoglobulin

in the same site 🗶



B. He should have a tetanus booster

C. There is no need for any treatment as he is fully vaccinated

D. He should have a tetanus booster in his left arm and human tetanus immunoglobulin in his right arm

E. He should have his tetanus antibodies checked before deciding on a booster

Wound contaminated with soil, manure is high risk wound. This patient is up to date with immunisation and more than 10 years are passed following last dose. He requires immediate reinforcing of both tetanus immunoglobulin and vaccine at different sites. Tetanus priming dose are given at 2,3,4, preschool booster (4 years and 3 months) and then booster dose after every 10 years.

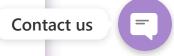
<u>Tetanus prone wound</u>

- **Clean wounds** are defined as: wounds less than 6 hours old, non-penetrating with negligible tissue damage.
- **Tetanus-prone wounds include** puncture-type injuries acquired in a contaminated environment and likely therefore to contain tetanus spores e.g., gardening injuries, compound fractures, wounds or burns with systemic sepsis and certain animal bites and scratches.
- **High risk tetanus-prone wound:** Heavy contamination with material likely to contain tetanus spores e.g., soil, manure, wounds or burns that



show extensive devitalised tissue and wounds or burns that require surgical intervention that is delayed for more than six hours are high risk even if the contamination was not initially heavy.

Immunisation Status	Immediate treatment		Later (5)	
	Clean wound ¹	Tetanus Prone	High risk tetanus prone	treatment
Those aged 11 years and over, who have received an adequate priming course of tetanus vaccine² with the last dose within 10 years Children aged 5-10 years who have received priming course and preschool booster Children under 5 years who have received an adequate priming course	None required	None required	None required	Further doses as required to complete the recommended schedule (to ensure future immunity)
Received adequate priming course of tetanus vaccine ² but last dose more than 10 years ago Children aged 5-10 years who have received an adequate priming course but no preschool booster Includes UK born after 1961 with history of accepting vaccinations	None required	Immediate reinforcing dose of vaccine	Immediate reinforcing dose of vaccine One dose of human tetanus immunoglobulin ³ in a different site	Further doses as required to complete the recommended schedule (to ensure future immunity)
Not received adequate priming course of tetanus vaccine ² Includes uncertain immunisation status and/ or born before 1961	Immediate reinforcing dose of vaccine	Immediate reinforcing dose of vaccine One dose of human tetanus immunoglobulin ³ in a different site	Immediate reinforcing dose of vaccine One dose of human tetanus immunoglobulin ³ in a different site	



A 55--year--old male presents to the ED with complaint of shortness of breath. He is known case of asthma. Which of the following results would you expect to find on spirometry?

A. Low TLC

B. Increased FEV1 /FVC ratio

C. Low FEV1/FVC ratio

D. High FVC

E. Increased FEV1

- Obstructive lung disease like (Asthma and COPD): Low FEV1/FVC ratio
- Restrictive lung disease: High FEV1/FVC ratio

Note: Be familiar with all the spirometry findings in obstructive and restrictive lung disease.



Obstructive lung disease	Restrictive lung disease
asthma, COPD,	Intrinsic causes:
emphysema,	interstitial lung disease
bronchiectasis	(Lung fibrosis) , pulmonary
	oedema, pneumonia
	Extrinsic causes: pleural
	effusion, pneumothorax,
	chest wall deformities,
	neuromuscular disease,
	connective tissue disease
	and obesity
Normal or low FVC	Low FVC
Low FEV1 (Recall)	Low FEV1
Low FEV1/FVC ratio	High FEV1/FVC ratio
(Recall)	
Low vital capacity	Low vital capacity
Residual volume high	Residual volume
Total lung capacity	Total lung capacity low
Normal or high	

After a bone fracture, the body initiates a healing process. Which one of the following cells are responsible for re-modelling stage of bone healing?



B. Osteoclasts
C. Chondrocytes
D. Osteocyte
E. Macrophages

Stages of bone/fracture healing:

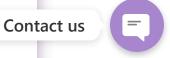
- Hematoma formation (Immediately in Day 1)
- Inflammation and proliferation (8 hours to 1-2 weeks) predominant cells neutrophils and macrophages
- Callus formation (2-3 weeks)
- Consolidation (2 to 3 months)
- Re-modelling (2 months to years) Osteoclasts are responsible.

<u>High yield:</u>

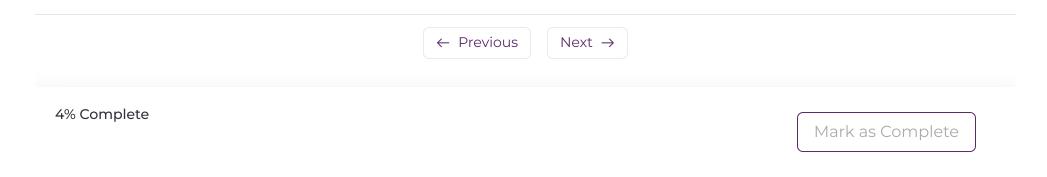
Factors that prevent efficient healing:

- Malnutrition
- Infection
- Corticosteroids therapy
- Poor blood supply

Complications of Healing



- Hypertrophic scar
- Keloid formation
- Failure to heal (abscess or empyema formation)
- Failure to unite (skin, muscle or fascia wound breakdown)
- Fracture complications





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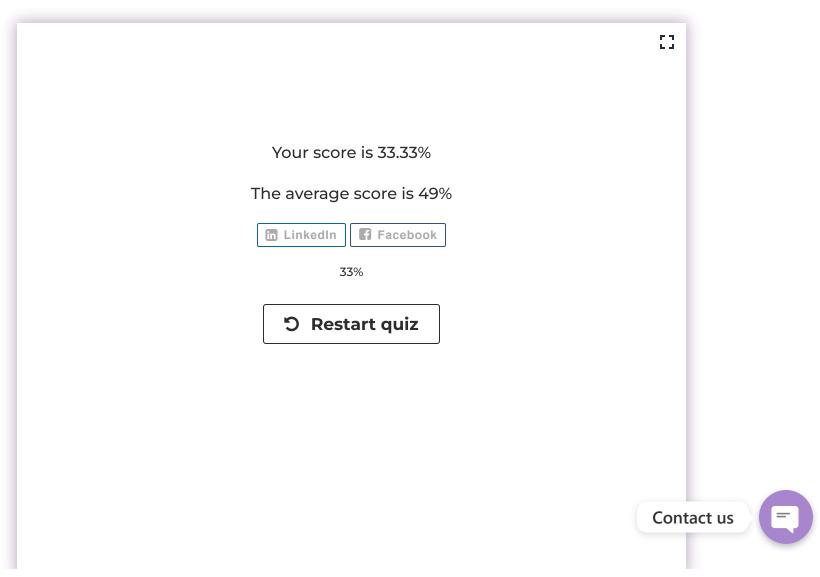
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About Lesson



You have not answered this question

Randomisation such as that used in randomised control trials are particularly effective in eliminating which of the following?

- A. Loss to follow up
- B. Measurement bias
- C. Observer bias
- D. Attrition bias
- E. Selection bias



Randomisation in RCTs if done correctly, should eliminate bias in treatment assignment, specifically selection bias and confoundin g.

Bias in Randomised controlled trials:

- Performance bias occurs when participants know if they are in the c ontrol group and seek other forms of medical care.
- Observer bias occurs where observers interpret a person's behavior i
 ncorrectly and do not notice other behaviours, and attribute results
 according to the group the participant is allocated. Double blinding



reduces performance and observer bias. Measurement bias is somet imes also referred to as systemic error.

 Attrition bias results from systematic differences between treatment groups as a result of differential withdrawals or exclusions of particip ants

High yield: Bias and its types

1: Selection bias is a distortion in the estimate of association betwe en risk factor and disease that results from how the subjects are sel ected for the study.

2: Information bias is due to systematic measurement error or miscl assification of subjects on one or more variables, either risk factor or disease status. There are several types of information bias, includin g:

- Interviewer Bias: An interviewer's knowledge may influence the str ucture of questions and the manner of presentation, which may influence responses.
- Recall Bias: Those with a particular outcome or exposure may reme mber events more clearly or amplify their recollections
- **Observer Bias:** Observers may have preconceived expectations of w hat they should find in an examination
- Loss to follow-up: those that are lost to follow-up or who withdraw f
 rom the study may be different from those who are followed for the
 entire study

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• **Reporting bias:** occurs when a case emphasizes the importance of exposures that he or she believes to be important.

3: Confounding: Results when the risk factor being studied is so mi xed up with other possible risk factors that its single effect is very difficult to distinguish.

2/15

Regarding culture medium for bacterial growth, neisseria spp grow on which one of the following culture media?

A. Blood agar

B. Solid media

C. Choclate agar

D. MacConkey medium

E. Loeffler's medium



Culture Medium For Bacterial Growth



11/5/23, 3:25 PM QUIZ : 30 | MRCEM EXPERT

Blood Agar	Culture of gram-negative bacteria such as E-Coli		
Choclate agar	Culture of haemophilus influenza and Neisseria spec		
MacConkey medium	Culture of fastidious organisms such as streptococcus species		
Loeffler's medium	Culture of Corynebacterium diphtheriae		

3/15

You have not answered this question

Which of the following statements regarding experimental studies is true?

- A. Examples include case-control studies
- B. Randomisation serves to remove potential bias



- C. Patients can only receive treatment or placebo
- D. Examples include cohort studies
- E. They must be blinded
- Experimental studies are characterised by the fact that the study su bjects are allocated by the investigator to the different study groups through the use of randomisation. This randomisation serves to re move any potential bias.
- Clinical trials are experimental studies and may be



- **Double-blind**: where neither the patient nor the investigator for the treating clinician) are aware of or which treatment the patient has b een randomised to receive.
- **Single-blind:** where either the patient or the researcher (or the treating clinician) is not aware which treatment the patient has been rand omised to, in these studies it is usually the patient that is not aware of the treatment type.
- **Unblinded:** these are also known as open studies. Both the patient a nd the researcher (or treating clinician) are aware of the treatment t ype.
- Case-control and cohort studies are examples of observational studies.

A 12-year-old girl develops facial swelling and an erythematous itchy rash shortly after being administered the first dose of the HPV vaccine. On arrival the paramedics note a bilateral expiratory wheeze and blood pressure of 80/50 mmHg of the Gell and Coombs classification of hypersensitivity reactions this is an example of a:

A. Type II reaction

B. Type IV reaction

C. Type I reaction



E. Type III reaction

Type1	Type2	Type3	Type4
IGE	IgG OR IGM	IgG (Recall)	T Cells
mediated			mediated
Urticaria	Red blood	Post-streptococcal	Mostly
Angioedema	cell	glomerulonephritis	Т
Allergic	destruction	(Recall)	Contact
rhinitis	after	Rheumatoid	(Touch)
Hay fever	transfusion	arthritis (Recall)	dermatitis
Anaphylaxis	with	systemic lupus	(Recall)
	mismatched	erythematosus	Tuberculin
	blood		skin test
	(Recall) or		Type 1
	during		diabetes
	hemolytic		Transplant
	disease of		rejection
	the		
	newborn.		

5/15

A 26-year-old female came into ED with complain of diplopia on upward gaze in her right eye. She gives history trauma to the face while dancing during the





festival and sustaining orbital blow out fracture. Entrapment of which one of the following muscles leads to this?

A. Superior rectus muscle

B. Inferior rectus muscle

C. Lateral rectus muscle

D. Medial rectus muscle

E. Superior oblique muscle

Orbital blow out fracture

- MOI: Direct blow to the globe of the eye (commonly from a squash ball or a shuttlecock), resulting in a fracture of the orbital floor and prolapse of contents into the maxillary sinus.
- Clinical features: Pt may have diplopia and can't look up and medially due to inferior rectus entrapment.
- Test infra-orbital nerve function as infra-orbital nerve commonly damage in this injury.

6/15

You have not answered this question

Regarding the validity of a study, which of the following is correct statement?



- A. A confounding factor is a variable that is of direct interest to the study
- B. Random error is always present in a measurement



- C. Selection bias is a form of random error
- D. Randomization will increase confounding
- E. Random error increases with increasing sample size
- Selection bias is a form of systematic error.
- Random error is always present in a measurement. They are caused by unpredictable fluctuations in the readings of a measurement app aratus or in the experimenters' interpretation of the instrumental re ading
- Random error will reduce with increasing sample size. (Recall)
- Randomisation will reduce confounding.
- A confounding factor is a background variable that is not of direct in terest to the study.

You have not answered this question

Type of bias in which knowledge, beliefs, or expectations may influence the participant's responses and interviewr is not blinded?



A. Observer bias

B. Recall bias

C. Interviewer bias



D. Confounding bias

E. Selection bias

The type of bias in which interviewer are not blinded is known as int erviewer bias. This occurs when the interviewer's knowledge, belief s, or expectations influence the participant's responses. For exampl e, if an interviewer believes that a particular treatment is effective, t hey may unintentionally give cues or ask leading questions that enc ourage participants to report positive outcomes, even if they did not experience them. Similarly, if an interviewer is aware of a participan t's demographic or clinical characteristics, they may unintentionally treat them differently or interpret their responses in a biased way. To minimize interviewer bias, researchers can use standardized interview protocols, train interviewers to be neutral and non-directive, and blind interviewers to the study hypotheses or participant characte ristics.

High yield: Bias and its types

1: Selection bias is a distortion in the estimate of association betwe en risk factor and disease that results from how the subjects are sel





ected for the study.

2: Information bias is due to systematic measurement error or miscl assification of subjects on one or more variables, either risk factor or disease status. There are several types of information bias, includin g:

- Interviewer Bias: An interviewer's knowledge may influence the structure of questions and the manner of presentation, which may influence responses.
- **Recall Bias:** Those with a particular outcome or exposure may reme mber events more clearly or amplify their recollections.
- **Observer Bias:** Observers may have preconceived expectations of w hat they should find in an examination.
- Loss to follow-up: those that are lost to follow-up or who withdraw f rom the study may be different from those who are followed for the entire study.
- **Reporting bias:** occurs when a case emphasizes the importance of e xposures that he or she believes to be important.
 - **3: Confounding:** Results when the risk factor being studied is so mi xed up with other possible risk factors that its single effect is very difficult to distinguish.

8/15

A 40-year-old male with a history of chronic back pain underwent a prolonged course of steroid injections to manage his symptoms. Which one of the following hormones will increase in secondary adrenal insufficiency due to prolong steroid injection?





A. Insulin
B. Cortisol
C. ACTH
D. Aldosterone
E. CRH

Long-term steroid therapy can result in secondary adrenal insufficiency due to suppression of the hypothalamic-pituitary-adrenal axis. The aetiology of adrenal insufficiency can be differentiated by checking serum ACTH which is high in Addison's disease and suppressed in secondary adrenal failure due to hypothalamic or pituitary causes.

 In this condition, the hypothalamus may continue to release corticotropin-releasing hormone (CRH) in an attempt to stimulate the pituitary gland to produce more ACTH. However, the lack of ACTH production by the pituitary gland means that cortisol levels will not increase, despite high levels of CRH. Therefore, CRH levels may be high or normal, while ACTH levels are low in secondary adrenal insufficiency.

Note: If in question stem not mentioned secondary adrenal insufficiency then Cortisol would be correct because exogenous cushing syndrome is the most likely due to prolong steroid injection while secondary adrenal insufficiency is rare.



Primary v/s Secondary Adrenal insufficiency:

- In contrast to Addison's disease (primary adrenal insufficiency), secondary adrenal insufficiency is characterized by:
- Decreased pituitary secretion.
- No skin hyperpigmentation (because there is deficiency of ACTH)
- no hyperkalemia or metabolic acidosis (because aldosterone levels are normal)

9/15

You have not answered this question

Which of the following statements about cohort studies is true? Select ONE answer only.

A. They are longudinal in nature



- B. They look at groups of patients with the disease being studied
- C. They are usually shorter in duration than case-control studies
- D. They are a type of experimental study
- E. They are the best way to determine the prevalence of a disease
- A cohort study is a form of longitudinal, observational study that follows a group of patients (the cohort) forward in time to monitor the effects of a proposed aetiological factor upon them



- They follow a cohort of patients without a disease and evaluate the a bsolute and relative risk of contracting the disease state after expos ure to the aetiological agent. An example of a cohort would be a gro up of patients that have been exposed to a particular drug. This grou p could then be followed longitudinally to see if they develop a particular side effect or disease as consequence of this drug exposure. The comparison group can be the general population from which the cohort was drawn, or alternatively another subgroup of the cohort its elf
- They are therefore good at investigating rare exposures as the study design sets the exposure. A rare outcome is unlikely to appear durin g the study time and they are therefore poor at detecting rare
- Cohort studies are the best way to determine the incidence of a di sease: Cross-sectional studies are the best way to determine the p revalence of a disease.
- Cohort studies are often compared to case-control studies. They are generally more expensive and longer in duration than case-control s tudies but usually provide more useful and reliable information
- Subject-selection and loss to follow-up are no major potential sou rces of bias with cohort studies and confounding variables are the main problem with analysis of the results.

Which of the following is a cause of metabolic alkalosis?

A. Ethylene glycol ingestion



B. Chronic renal failure

C. Treatment with acetazolamide

D. Hyperaldosteronism



E. Diarrhea



Metabolic alkalosis

- Loss of fixed H+ or gain of base produces an increase in arterial [HCO3-]. This increase is the primary disturbance in metabolic alkalosis.
- In vomiting H is lost from stomach, HCO3 remains behind in the blood, and the [HCO3] increases, increased [HCO3] causes an increase in blood PH (Alkalemia). Alkalemia causes hypoventilation which is the respiratory compensation for metabolic alkalosis. It has features of hypocalcemia (decreased unbound plasma Ca) and hypokalemia (because of IC shift of K) e.g., tetany, paresthesia, muscle cramps.
- Correction of metabolic alkalosis consists of increased excretion of HCO3 because the filtered load of HCO3 exceeds the ability of renal tubule to reabsorb it.
- If metabolic alkalosis is accompanied by ECF volume contraction (vomiting), the reabsorption of HCO3 increases (secondary to ECF volume contraction and activation of the renin angiotensin II aldosterone system), worsening the metabolic alkalosis (contraction alkalosis).

Contact us



Causes:

Gastrointestinal losses

- Vomiting, nasogastric drainage, pyloric stenosis
- Some villous adenomas

Renal losses

• Chloruretic drugs (e.g., thiazides, furosemide)

Mineralocorticoid excess syndromes

Primary Hyperaldosteronism

Other causes:

- Alkali intake or administration
- Milk alkali syndrome
- severe potassium depletion (serum potassium <2 mmol/L)

11 / 15

A 30 years old male patient presents with right eye abduction deficit. Which nerve is likely affected?

A. Right abducens nerve



B. Right oculomotor nerve

C. Right trochlear nerve

D. Left oculomotor nerve



E. Left oculomotor nerve

Right eye abduction deficit leads to adduction of right eye and unable to abduct right eye.

 The right abducens nerve innervates the right lateral rectus muscle, which is responsible for abduction (movement away from the midline) of the right eye

High yield:

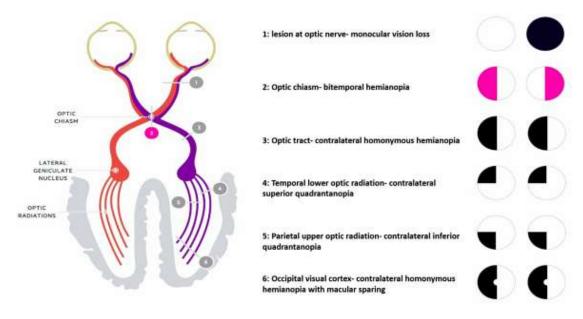
Movements of the eyeball (Extra ocular muscles)

All the extraocular muscles are innervated by oculomotor nerve except
 LR-6 and S0-4

Muscle	Nerve innervation	Function
Superior rectus	Oculomotor nerve	Elevation and medial rotation of eyeball
Inferior rectus	Oculomotor nerve	Depression, lateral rotation and adduction
Medial rectus	Oculomotor nerve	Adduction
Lateral rectus (LR6)	Abducent nerve	Abduction of eyeball (Horizontal diplopia (Recall)
Superior oblique (SO4)	Trochlear nerve	Depression, abduction and medial rotation of eyeball (Vertical diplopia)
Inferior oblique	Oculomotor nerve	Elevation, abduction and lateral rotation

Remember the lesions of visual pathway (High yield)





A 20-year-old man fell from the parallel bar during the Olympic trial. A neurologic ex- amination reveals that he has a lesion of the lateral cord of the brachial plexus. Which of the following muscles is most likely weakened by this injury?

A. Latissimus dorsi

B. Teres minor

C. Subscapularis



D. Teres major



E. Pectoralis major 🕡

The pectoralis major is innervated by the lateral and medial pectoral nerves originating from the lateral and medial cords of the brachial plexus, respectively. The subscapularis, teres major, latissimus dorsi, and teres minor muscles are innervated by nerves originating from the posterior cord of the brachial plexus

High yield:

BRANCHES OF LATERAL CORD "LML"

- Lateral pectoral nerve
- Musculocutaneous nerve
- Lateral root of median nerve

BRANCHES OF MEDIAL CORD "M4U"

- Medial pectoral nerve
- Medial cutaneous nerve of arm
- Medial cutaneous nerve of forearm
- Medial root of median nerve
- Ulnar nerve

BRANCHES OF POSTERIOR CORD "ULTRA"

- Upper subscapular nerve
- Lower subscapular nerve



You have not answered this question

A well established, commonly used, anti-hypertensive medication has been suggested as a potential cause of type II diabetes mellitus. Which of the following study designs would be most appropriate to safely determine whether an association exists?

- A. cohort study
- B. A crossover study
- C. double-blind randomised controlled trial
- D. case-control study
- E. meta-analysis 🕡

In this particular case **a meta-analysis** would be the most appropria te study design for the following reasons:

- The medication is already established and commonly used
- Clinical trials are likely to have already been performed in order for it s use in clinical practice to be licensed



The data needed should be able to be obtained rapidly and inexpensively

Note: Funnel plots are a visual tool for investigating publication a nd other bias in meta-analysis (Recall)

- A double-blind randomised controlled trial seems unreasonable in this case as the investigators would be exposing a large number of n ew patients to a potential side effect (type I diabetes mellitus).
- The crossover design is a modification of the randomised controlled trial (a type of experimental study), in which each patient receives tr eatment and placebo in a random order. This again seems unreason able in this case.
- A cohort study is a type of observational, longitudinal study that loo ks at a group of people that share a common characteristic or experience and follows them over a set time period to analyze their risk of developing a certain disease. The time period and expense involved in this type of study would make it a less suitable option than a meta-analysis in this case.
- A case-control study is another type of observational study in which two groups of patients, one with the disease and one without, are compared on the basis of proposed causative factors that occurred in the past. This is again, unsuitable in this case.



You have not answered this question

Which of the following statistical statements is incorrect?

A. The number needed to treat (NNT) can be calculated by 1 divided by the absolute risk reduction

B. The prevalence of a disease is the rate at which new cases occur in a population during a specified period

C. The relative risk measures the strength of association between a factor and an outcome

D. In a normal distribution the median is the middle point of the observations

E. The specificity is the proportion of true negatives correctly identified by the test

- The prevalence of a disease is the proportion of the population affe cted by that disease at a specific time.
- The incidence of a disease is the rate at which new cases occur in a population during a specified period.



- Relative risk, or risk ratio, (RR) is used to compare the risk in the two different groups. It is the ratio of the absolute risks of the disease in the treatment group (ART) to the absolute risk of the disease in the control group (ARC). It measures the strength of association between a factor and an outcome.
- In a normal distribution the median is the middle point of the obser vations.
- The number needed to treat (NNT) is defined as the inverse of the ab solute risk reduction (ARR) and can therefore be calculated by: NNT = 1 / ARR
- The specificity is the proportion of true negatives correctly identified by the test

During a cholecystectomy procedure, the surgeon accidentally lacerates the artery. Which one of the following arteries supplies gall bladdar?

A. Superior mesenteric artery

B. Cystic artery

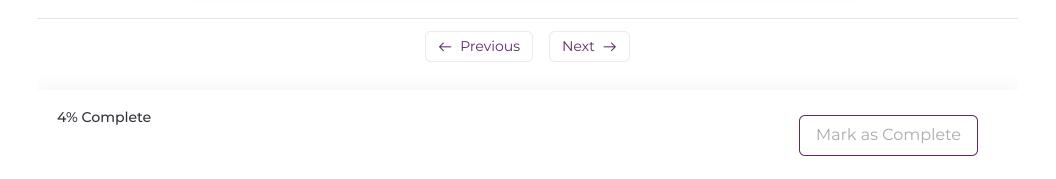
C. Splenic artery

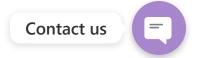
D. Right hepatic artery

E. Inferior mesenteric artery



Gall bladder blood supply: cystic artery branch of right hepatic artery. Right hepatic artery is itself branch of common hepatic artery one of branch of coeliac trunk.





QUIZ : 31 | MRCEM EXPERT

← Mrcem Primary Complete Course ,High Yield Stuff and Similar to Previous Exam Questions With Explanation (For Diet 2)

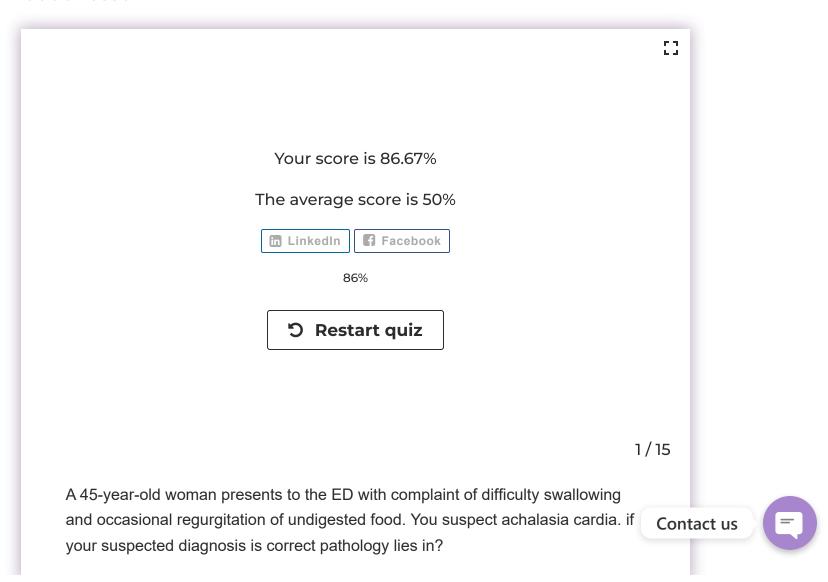


Overview •

Comments

About Lesson

11/5/23, 3:29 PM



- A. Atrophy of the lower esophageal sphincter
- B. Fibrosis of the esophageal submucosa
- C. Dysfunction of the myenteric plexus ganglion cells



- D. Inflammation of the esophageal mucosa
- E. Dysfunction of the Meissner plexus

Achalasia cardia:

 Primary esophageal motility disorder characterized by the impaired relaxation of the lower esophageal sphincter (LES) and absence of peristalsis in the esophagus. This condition is primarily attributed to dysfunction in the myenteric plexus, which is a network of nerve fibers and ganglion cells located between the circular and longitudinal muscle layers of the esophagus.

Meissner and Myenteric plexus:

Submucosal plexus (Meissner plexus)	 Neurons and ganglia that lie within the submucosal layer of the alimentary canal. 	Regulates local gastrointestinal secretion and nutrient absorption.
Myenteric plexus (Auerbach plexus)	 Neurons and ganglia that lie between the longitudinal and circular smooth muscle layers of the muscularis propria. 	Regulates inherent myogenic motility of the GIT.



A 22-year-old college student received a severe blow on the inferolateral side of the left knee joint while playing football. Radiographic examination reveals a fracture of the head of fibula. Which one of the following nerves is damaged?

- A. Saphenous nerve
- B. Sciatic nerve
- C. Tibial nerve
- D. Common peroneal nerve
- E. Deep peroneal nerve

Common fibular (Peroneal nerve)

Arises as the smaller terminal portion of the sciatic nerve at the apex of the popliteal fossa. The common fibular nerve continues by wrapping around the neck of the fibula and passing between the attachments of the fibularis longus muscle to enter the lateral compartment of the leg where it divides into its terminal branches, the superficial and deep fibular nerves.



Nerve roots	L4 – S2
Motor supply	Directly: Short head of the biceps femoris
	Terminal Branches:
	Deep fibular nerve: All muscles in the anterior compartment of leg and intrinsic dorsal foot muscles
	Superficial fibular nerve: Muscles of lateral compartments of the leg.
Sensory supply	Directly: Skin over the upper lateral leg via lateral sural cutaneous nerves.
42.5	Terminal Branches:
	Deep fibular nerve: Skin over the web-space between first and second toe.
	Superficial fibular nerve: Skin over lower anterolateral leg, dorsum of the foot except web space between first and second toe.

Note: It is very important to remember direct innervation of common fibular nerve.

- Deep fibular nerve root: L4-L5
- Superficial fibular nerve root: L4-S1.

Clinical pearls:

1: <u>Common fibular nerve injury:</u> Damage to the common fibular (peroneal) nerve may occur as a result of fracture of the head or neck of the fibula because it passes behind the head of the fibula and then winds laterally around the neck. The nerve damage **results in foot drop (loss of dorsiflexion)** and loss of sensation on the dorsum of the foot and lateral aspect of the leg and causes paralysis of all muscles in the anterior and lateral compartments of the leg (dorsiflexors and evertors muscles of the foot).

2: <u>Superficial fibular nerve</u>: May be damaged by fracture of the fibula. As the muscles that the superficial fibular nerve innervates are



evertors, injury to the nerve may result in a loss of eversion and loss of sensation over the lower anterolateral leg and dorsum of foot.

3: <u>Deep fibular nerve:</u>

Motor Loss: Loss of dorsiflexion of ankle resulting in foot drop. In foot drop foot will appear permanently plantarflexed, foot drop with high-stepping gait, weakness of foot inversion.

Sensory Loss: Loss of sensation over webspace between 1st and 2nd toes.

Note: Footdrop is due to Common fibular or common peroneal nerve or also due to deep fibular nerve injury.

3/15

A 55-year-old male brought into the ED with advanced liver failure. Which one of the following drugs does not need dose adjustments in this patient?

A. Morphine

B. Bisoprolol

C. Digoxin

D. Diazepam

E. Furosemide



- <u>Liver failure</u>: Liver failure has little influence on digoxin metabolism or clearance; therefore, no dose adjustment is necessary.
- Renal failure: Digoxin is excreted renally, and impaired renal function can cause increased digoxin levels and digoxin toxicity. In this case the patient should have their digoxin dose reduced and their digoxin level and electrolytes should be carefully monitored.

A 34-year-old woman is rushed to the emergency department with severe abdominal pain radiating to her back. She describes the pain as sudden and excruciating, and it is accompanied by nausea and vomiting. Her past medical history includes heavy alcohol consumption. Which one of the following enzymes is secreted in an active status in pancreatic juice, causing this condition?

A. Trypsin

B. Pepsinogen

C. Trypsinogen

D. elastase

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E. Chymotrypsinogen

Acute pancreatitis:

• Inflammation of the pancreas occurs in when digestive enzymes secreted in pancreatic juice start digesting its own tissues

Pathophysiology:

- Trypsin is an enzyme that is involved in the digestion of proteins.
 Normally, trypsinogen (the inactive precursor of trypsin) is activated to trypsin in the small intestine, where it aids in protein digestion.
 However, in cases of pancreatitis, trypsin can become prematurely activated within the pancreas itself due to factors like alcohol consumption or other triggers. This activation of trypsin within the pancreas can lead to the autodigestion of pancreatic tissue, causing inflammation.
- Chymotrypsinogen is the inactive precursor of chymotrypsin.
 Activation of chymotrypsinogen to its active form, chymotrypsin, occurs through the action of trypsin. Once trypsin is produced through the activation of trypsinogen, it can then activate chymotrypsinogen by cleaving it to chymotrypsin. Chymotrypsin further breaks down protein molecules into smaller peptides and amino acids that can be absorbed by the body.

Note: Both Pancreatic lipase and amylase can be elevated in cases of pancreatitis, but lipase is often considered a more reliable marker due to its higher specificity and longer elevation period. Clinically, lipase levels are preferred for diagnosing and assessing the severity of pancreatitis.

A 24-year-old male presents to the ED with complaint of pain in umbilical region radiating towards right lower abdomen. You suspect appendicitis and perform psoas muscle inflammation in appendicitis. When you perform psoas sign pain is aggravated by which one of the following movements?

A. Lateral rotation

B. Extension

C. Medial rotation



D. Abduction

E. Adduction

- Psoas sign: Pain on extension
- Obturator sign: Pain on internal or medial rotation

High yield:

- Rovsing's sign: Pain in the right lower quadrant is complained of when palpation pressure is exerted in the left lower quadrant. It is also called referred rebound tenderness and when present is quite helpful in supporting the diagnosis.
- <u>Psoas sign:</u> This test is performed by having the patient lie on his left side. The examiner then slowly extends the patient's right thigh, thus



stretching the iliopsoas muscle. This will produce pain to make the sign positive. This indicates presence of irritative inflamed appendix in close proximity to the psoas muscle. This is possible in retrocaecal appendicitis.

• <u>Obturator test:</u> Passive internal rotation of flexed right thigh with the patient in supine position will elicit pain. This positive obturator sign is diagnostic of pelvic appendicitis.

6/15

A 35-year-old male patient brought into the ED with femoral fracture Requiring general anesthesia for surgery. Which one of the following glands inhibited is most responsible for saliva production during GA?

A. Adrenal gland

B. Sublingual

C. Thyroid gland

D. Sub mandibular

E. Parotid gland

• During General Anesthesia, the parotid gland is the major salivary gland most responsible for saliva production, and it is more likely to be affected by the anesthesia-induced inhibition of salivation compared to the sublingual gland.



- <u>Parotid Gland:</u> The parotid gland is primarily responsible for producing serous saliva. During GA, the parasympathetic nervous system is suppressed, which can lead to a significant reduction in saliva production from the parotid gland.
- <u>Sublingual Gland:</u> The sublingual gland primarily produces mucous saliva. While it is also influenced by the autonomic nervous system, the effect of GA on the sublingual gland may not be as pronounced as on the parotid gland. The reduction in saliva from the sublingual gland is typically less significant during GA.

A 12-year-old boy presents with evidenced by dark stools (melena). He has had no other gastrointestinal symptoms and is otherwise healthy. Considering his age and the symptom pattern, Meckel's diverticulum is suspected. Which one of the following is the most common mode of presentation in this child?

A. Obstruction

B. Hernia

C. Persistent fever and diarrhea

D. Bleeding

E. Diverticulitis

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<u>Meckel's Diverticulum:</u>

- True diverticula of all 3 layers of the small intestines
- Caused by incomplete obliteration of the vitelline duct.
- Rule of 2s: 2 years old, 2 ft from ileocecal valve, 2 in long, 2% of population
- Usually, asymptomatic
- Painless bleeding due to an ulcer caused by heterotopic gastric tissue most common presentation in children
- Obstruction is caused by intussusception, volvulus, and hernia, the most common presentation in adults.

A 25-year-old patient presents with a stab injury to the groin area. He has damaged a structure that lies immediately medially to the femoral nerve in femoral triangle. Which one of the following is correct?

A. Iliacus muscle

B. Femoral canal

C. Femoral vein

D. Sartorius

E. Femoral artery

High Yield:



Contents of Femoral Triangle:

From lateral to medial: Useful mnemonic (NAVEL)

- Femoral nerve
- Femoral artery
- Femoral vein
- Empty space (consists of femoral canal)
- Lymph nodes

Note: Femoral nerve lies lateral to femoral artery and vein

<u>Clinical pearls:</u> In Femoral hernia part of the bowel pushes into the femoral canal underneath the femoral triangle

Important to remember here:

Femoral Canal:

• The Femoral canal lies most medial of the femoral sheath.

Borders of the femoral canal: (Useful mnemonic LAMP: FILP)

- Lateral border: Femoral vein (Immediately lateral)
- Anterior border: Inguinal ligament
- Medial border: Lacunar ligament
- Posterior ligament: Pectineal ligament, Pectineus muscle and superior ramus of pubic bone.

<u>Contents:</u> Deep inguinal lymph nodes, lymphatic vessels, empty space and loose connective tissue.



A 40-year-old male was brought into to the ED after he falls approximately 20 feet whilst tiling a roof. He suffers a femoral shaft fracture that damages a branch of the posterior division of the femoral nerve. Which of the following muscles is supplied by a branch of the posterior division of the femoral nerve?

A. Psoas major

B. Sartorius 💥



D. Iliacus

E. Pectineus

High Yield:

Femoral nerve	Muscle attached
In abdomen	• Iliacus
Anterior division of femoral nerve	SartoriusPectineus
Posterior division of femoral nerve	Rectus femorisVastus lateralisVastus intermediusVastus medialis

A 25-year-old male patient exhibits a loss of sensation and pain at lateral thigh. Which one of the following nerves is responsible for this?

- A. Posterior cutaneous nerve of thigh
- B. Lateral cutaneous nerve of thigh



- C. Anterior cutaneous branches
- D. Obturator nerve
- E. Saphenous nerve



High Yield to Remeber:

Anterior division of the femoral nerve

- Anterior cutaneous branches
- Branch to sartorius
- Branch to pectineus

2: Posterior division of the femoral nerve

- Saphenous nerve
- Branches to quadriceps femoris (Which include Rectus femoris,
 Vastus lateralis, Vastus medialis and Vastus intermedius)

<u>Femoral nerve</u> Sensory innervation of lateral and posterior thigh: (Important to remember)

Posterior cutaneous nerve	Sacral plexus (S1 – S3)	Posterior thigh
Lateral cutaneous nerve of thigh	Lumbar plexus (L2, L3)	Lateral thigh

<u>Clinical pearls:</u> Damage to the posterior division of femoral nerve causing impaired flexion at hip and impaired extension of the leg resulting from paralysis of the quadriceps femoris (Which include Rectus femoris, Vastus lateralis, Vastus medialis and Vastus intermedius.

<u>Sensory loss:</u> Loss of sensation over anteromedial thigh, anteromedial knee, medial leg and medial foot.



You have been asked to administer an intramuscular injection to a patient in the Emergency Department. Which of the following anatomical points is the safest location in the gluteal region?

A. Upper outer

B. Lower lateral

C. Lower medial

D. Upper medial

E. Centrally within gluteal region

Clinical pearls:

Intramuscular injections in the gluteal region: The anatomical course of the sciatic nerve must be considered when administering intramuscular injections into the gluteal region. The region can be divided into quadrants using 2 lines.

- One line descends vertically from the highest point on the iliac crest.
- Other lines pass through vertical line halfway between the highest point.



Note: Sciatic nerve lies in the lower medial quadrant. To avoid injury of sciatic nerve IM injections in the gluteal region only be given in upper lateral or upper outer quadrant.

12 / 15

Which one of the following dermatomes is likely affected in medial knee side?

A. L4	
B. L1	
C. L3 🗸	
D. L2	

High Yield:

<u>Dermatomes of Lower extremity:</u> Important to remeber all the landmarks of dermatomes

- L1: The inguinal region and the very top of the medial thigh, Upper anterior thigh
- L2: The middle and lateral aspect of the anterior thigh.
- L3: Medial knee (Medial femoral condyle)
- L4: Medial malleolus, Medial surface of big toe



- L5: Toes 2-3,4, lateral surface of big toe and Dorsal and plantar aspects of foot
- S1: Toe 5 (Little finger), lateral malleolus
- S2: At the midpoint of the popliteal fossa.
- S3: At the horizontal gluteal crease (fold of the Buttocks), Ischial tuberosity
- S4/5: The perianal area.

A 50-year-old male presents to the ED with complaint of pain and numbness in his lower limb. On further examination he has loss of sensation in lower leg near the medial malleolus. Which one of the following dermatomes is likely affected?

A. L2

B. L5

C. L1

D. L3

E. L4 🎻

High Yield:

<u>Dermatomes of Lower extremity:</u> Important to remeber all the landmarks of dermatomes



- L1: The inguinal region and the very top of the medial thigh, Upper anterior thigh
- L2: The middle and lateral aspect of the anterior thigh.
- L3: Medial knee (Medial femoral condyle)
- L4: Medial malleolus, Medial surface of big toe
- L5: Toes 2-3,4, lateral surface of big toe and Dorsal and plantar aspects of foot
- S1: Toe 5 (Little finger), lateral malleolus
- S2: At the midpoint of the popliteal fossa.
- S3: At the horizontal gluteal crease (fold of the Buttocks), Ischial tuberosity
- S4/5: The perianal area.

A 30-year-old man is involved in a road traffic accident and suffers a serious injury to his right thigh. As a consequence of his injury, he damages the obturator canal. Which one of the following clinical manifestations is possible?

- A. Anterior thigh Sensory loss
- B. Lateral thigh motor loss
- C. Medial thigh motor loss



E. Posterior compartment motor and sensory loss



The obturator canal transmits the obturator nerve and vessels, which primarily supply the muscles of the medial thigh. Damage to the obturator canal could result in motor and sensory deficits in medial thigh

Obturator nerve

- Nerve roots: L2-L4
- Motor functions: Innervates the medial thigh muscles.
- Sensory functions: Upper medial thigh via cutaneous branches

<u>Anatomical course:</u> Arises from the lumbar plexus formed within psoas major muscle and enters the thigh through **obturator canal.** (a small opening in the superior aspect of the obturator foramen)

- <u>Note:</u> The obturator nerve innervates all of the muscles of the medial compartment of the thigh (except for the hamstring part of the adductor magnus innervated by the tibial portion of the sciatic nerve).
- <u>Clinical:</u> Damage to the obturator nerve causes weakness of adduction, resulting in a lateral swinging of the limb during walking
- Sensory Loss: Loss of sensation over upper medial thigh

15 / 15

A 60-year-old patient was involved in a road traffic accident and subsequently complained of unable to perform extension of thigh at hip and flexion at knee joint. Which one of the following nerves is likely affected?

A. Obturator nerve

B. Sciatic nerve



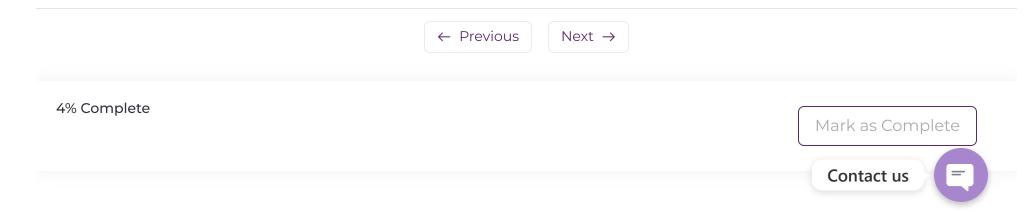
C. Common peroneal nerve

D. Femoral nerve

E. Saphenous nerve

 All the muscles of the posterior compartment of thigh are extensors of thigh at hip and flexors at knee joint. While Biceps femoris is also lateral rotator of thigh at hip joint and Semitendinosus and Semimembranosus also medial rotators of thigh at hip joint

<u>Clinical pearls:</u> All the muscles of the posterior thigh originate from the ischial tuberosity of the pelvis. In some cases, mostly in young athletes, sudden and forceful contraction of the hamstring muscles can result in an avulsion fracture of the ischial tuberosity. It can also be associated with sciatic nerve damage.



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← Mrcem Primary Complete Course ,High Yield Stuff and Similar to Previous Exam Questions With Explanation (For Diet 2)

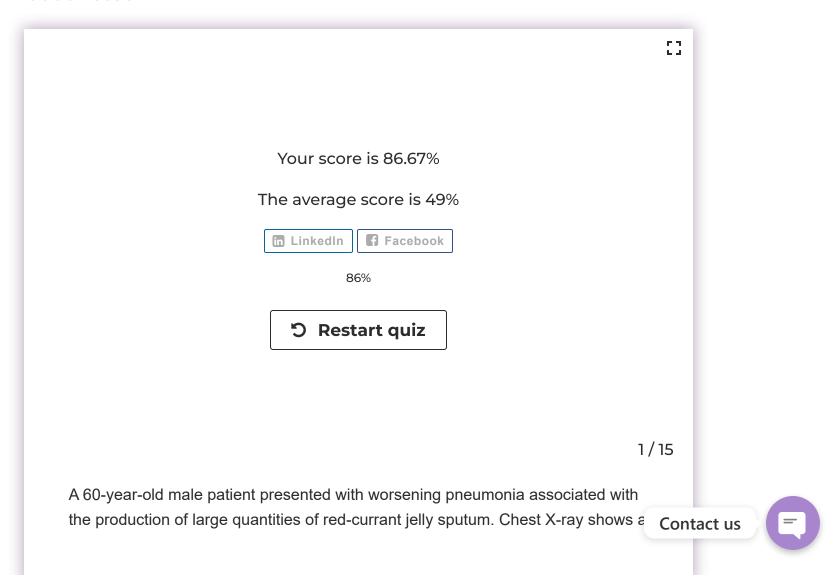


Overview •

E Comments

About Lesson

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cavity in the right upper lobe with a fluid level. What is the most likely infective organism?

- A. Heamophilus influenza
- B. Chlamydia Pneumonia
- C. Streptococcus Pneumonia
- D. Legionella Pneumonia
- E. Klebsiella Pneumonia 🎻



Klebsiella spp:

Microorganism	Klebsiella spp		
Gram stain	Gram negative		
• Shape	• Rods		
 Transmission 	Respiratory droplet or local spread of normal flora		
Reservoir	Intestine, nasopharynx and skin flora		
Additional features	 Klebsiella pneumonia is characterized by Thick bloody (Red currant jelly sputum) 		
• Diseases	 Catheter associated UTI, Ventilator associated pneumonia, meningitis, otitis media. 		

Escherichia Coli: (High Yield)



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Microorganism	porganism Escherichia coli		
Gram stain	Gram negative		
• Shape	• Rod		
Transmission	Faecal-oral, peripartum		
Reservoir	Intestinal flora, contaminated food and water		
 Additional features 	Produces exotoxin.		
• Diseases	 UTI (Most common cause of uncomplicated UTI in adults as well as most common cause of UTI in hospital acquired patients Diarrhoea, peritonitis, wound infections, abdominal sepsis, neonatal meningitis 		

Note: E. coli serotype O157 causes bloody diarrhoea associated with hemolytic uremic syndrome in children, characterized by hemolytic anemia, thrombocytopenia and acute renal failure.

Salmonella enterica

- is a gram-negative rod that causes enterocolitis (Food poisoning), Enteric fever (Typhoid), Septicemia, and osteomyelitis
- Primarily transmitted through fecal-oral route usually from ingestion of contaminated poultry, eggs, and uncooked meat

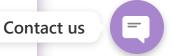
Treatment:

- Salmonella enterocolitis: Usually supportive management in resistant cases ciprofloxacin
- Enteric fever: First line ciprofloxacin if organism sensitive, and in resistant cases cefotaxime or azithromycin

<u>High yield:</u>

Regarding osteomyelitis

- Most common cause generally: Staph Aureus (Recall)
- The most common cause in IV drug abuser: Staph Aureus
- The most common cause in sickle cell disease: Salmonella



• Most common cause after hip replacement surgery: Staph epidermidis

2/15

A 40-year-old patient with history of tooth extraction presents to ED with 15 days history of fever, night sweats and malaise, and is noted to have a systolic murmur on examination. You suspect acute infective endocarditis, which of the following pathogens is the most likely cause?

- A. Pseudomonas aeruginosa
- **B. Staph Aureus**
- C. Staph epidermidis
- D. Staph Viridans
- E. Streptococcus pyogenes

High Yield:

- Most common cause generally: Staph Aureus (Recall)
- Most common cause in IV drug abuser: Staph Aureus
- Most common cause of infective endocarditis in prosthetic heart valves:
 Staph epidermidis
- Most common cause of infective endocarditis after tooth extraction surgery: Staph viridians



3/15

A 25-year-old woman falls down a flight of stairs and suffers a skull fracture. The fracture causes damage to Opthalmic (V1) nerve and loss of sensation to center of forehead and conjunctiva. Which one of the following nerves is likely affected?

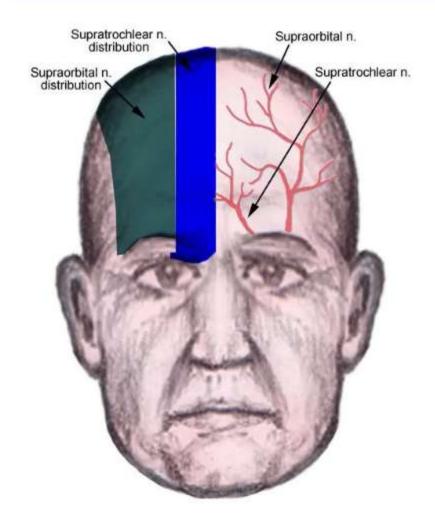
A. Supratrochlear nerve



- B. Zygomaticotemporal nerve
- C. Supraorbital nerve
- D. Inferior alveolar nerve
- E. Infraorbital nerve

The Skin of central part of the forehead, Skin of lower part of forehead and conjunctiva is innervated by the supratrochlear nerve, which is a sensory branch of the ophthalmic division (V1) of the trigeminal nerve (cranial nerve V). While Skin of upper forehead, Upper eyelid and conjunctiva innervated by 7 supraorbital nerve.





Trigeminal nerve: (High Yield)

Mixed motor and sensory nerve. It is also the largest cranial nerve. Arises from several nuclei in the brainstem, exits brainstem from pons It has three main divisions:

- 1: Opthalmic V1
- 2: Maxillary V2



• 3: Mandibular V3



Opthalmic division	Maxillary division	Mandibular
Exits cranium via superior orbital fissure	Arises from trigeminal ganglion passes through lateral wall of cavernous sinus, leave skull through foramen rotundum	Arises in middle cranial fossa, exits skull through foramen ovale, enters infratemporal fossa
Opthalmic nerve gives rise to 3 terminal branches: frontal, lacrimal and Naso ciliary 1: Frontal nerve: Supraorbital branch: Skin of upper eyelid and conjunctiva and skin of upper forehead Supratrochlear branch: innervate skin of lower part of forehead and conjunctiva 2: Lacrimal nerve: Innervating skin of the lateral half of upper eyelid and conjunctiva 3: Nasocilliary nerve: Intratracheal nerve: innervating the medial half of the upper eyelid and conjunctiva, and the bridge of the nose Long ciliary nerves (sensory innervation to eye (cornea, ciliary bodies, iris) and carries sympathetic fibers to dilator pupillae muscle)	Middle meningeal nerve Infraorbital nerve: innervating the lower eyelid, the cheek, the lateral nose and the upper lip Zygomaticotemporal nerve: innervating a small area of the anterior temple above the zygomatic arch	Branches of mandibular division Lingual Nerve: Anterior two- thirds of tongue (General sensation) Auriculotemporal Nerve: Carries sensory innervation from Skin over temple, external ear, external auditory meatus, outer tympanic membrane and temporomandibular joint Inferior Alveolar Nerve: Lower teeth and gingiva, further inferior alveolar nerve gives rise mental nerve which carry sensory innervation from skin of the lower lip and skin of chin. Buccal nerve: Skin and mucosa over cheek Masseteric Nerve: Motor innervation to masseter Deep Temporal Nerves: Motor innervation to Temporalis Lateral Pterygoid Nerve: Motor innervation to Lateral pterygoid, tensor tympani, tensor veli palatini

4/15

A 23-year-old man is involved in a fight outside a nightclub. He is cut across the face with the edge of a broken glass. Upon examination he has a lesion in the facial nerve and sensory loss in upper lip. Which one of the following facial nerve branches is affected?

A. Zygomatic branch



- B. Marginal mandibular branch
- C. Temporal branch
- D. Buccal branch

E. Infraorbital nerve



Facial nerve terminal branches in parotid gland:

- The cervical branch: innervating the platysma muscle.
- The temporal branch: innervating muscles in the temple, forehead muscles (frontalis) and supraorbital areas (upper half of orbicularis oculi muscle)
- The zygomatic branch: innervating muscles in the infraorbital area (Lower half of orbicularis oculi muscle), the lateral nasal area and the upper lip

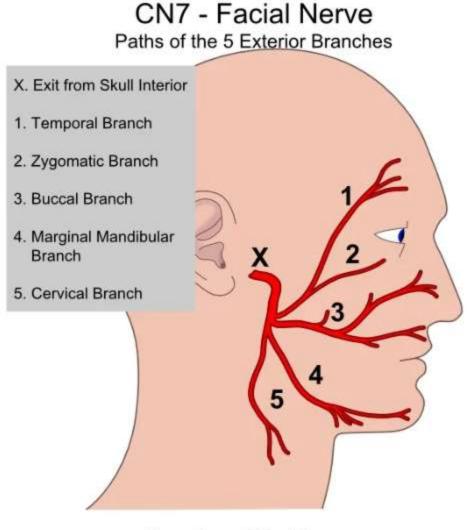
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• The buccal branch: innervating muscles in the cheek and upper lip

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• The marginal mandibular branch: innervating muscles of the lower lip and chin



Branches of Facial nerve

Facial nerve: (High Yield)



The facial nerve exits the cranial cavity through the internal acoustic meatus and enters the facial canal of the temporal bone. The nerve then exits the skull through the Stylomastoid foramen (lies between the styloid and mastoid processes of the temporal bone) to enter the parotid gland, ultimately branching into five terminal branches to supply the face.

<u>Cause of injury:</u> Bell's palsy, Ramsay-Hunt syndrome, Guillain-Barre syndrome, mumps, parotid tumor, and injury to the middle ear.

<u>Clinical effects of injury</u>: impaired sense of taste to anterior two-thirds of tongue, loss of efferent corneal reflex, impaired lacrimal fluid production, hyperacusis, and impaired salivation

Facial nerve branches in the temporal bone:

- The nerve to the stapedius: Innervate stapedius muscle.
- The greater petrosal nerve: parasympathetic innervation to the lacrimal gland and the mucous glands of the oral cavity, nose and pharynx
- The chorda tympani: supply taste to the anterior two-thirds of the tongue

<u>Facial nerve branches between the stylomastoid foramen and parotid gland:3 motor branches</u>

- **Posterior auricular nerve** innervates the intrinsic and extrinsic muscles of the outer ear.
- Nerve to the posterior belly of the digastric muscle: Innervates the posterior belly of the digastric muscle one of the suprahyoid muscles cannot responsible for raising the hyoid bone.



Nerve to the stylohyoid muscle: Innervates the stylohyoid muscle, one
of the suprahyoid muscles of neck responsible for raising the hyoid
bone.

Note: Greater auricular nerve cutaneous branch of the cervical plexus provides sensory innervation to ear lobule, skin over the parotid gland and mastoid process of the temporal bone. Pain of parotitis and during ear piercing is due to innervation of greater auricular nerve.

Facial nerve terminal branches in parotid gland:

- The cervical branch: innervating the platysma muscle.
- The temporal branch: innervating muscles in the temple, forehead muscles (frontalis) and supraorbital areas (upper half of orbicularis oculi muscle)
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- The buccal branch: innervating muscles in the cheek and upper lip
- The marginal mandibular branch: innervating muscles of the lower lip and chin

High yield:

- The chorda tympani branch of the facial nerve supplies taste sensation to the anterior 2/3 of the tongue.
- In the anterior 2/3, general sensation is supplied by the trigeminal nerve (CNV). Specifically, the lingual nerve, a branch of the mandibular nerve (CN V3).



• The posterior 1/3 of the tongue both touch and taste are carried by the **glossopharyngeal nerve (CNIX)**

5/15

A 30-year-old man sustains a pelvic injury in a road traffic accident that causes damage to the L1 Spinal nerves of lumbar plexus. Which one of the following muscles is likely affected?

A. Internal oblique and transversus abdominus



- B. Iliopsoas and pectineus
- C. External oblique and transversus abdominus
- D. Adductor longus and brevis
- E. Sartorius

Lumbar plexus: (High Yield)

- Formed by the union of the ventral rami of the first three lumbar nerves and a part of the fourth lumbar nerve.
- Lies anterior to the transverse processes of the lumbar vertebrae within the substance of psoas major muscle.



Nerve	Spinal Segment	Motor Function	Sensory Function	
Illiohypogastric nerve L1 Illioinguinal nerve L1 Genitofemoral nerve L1, L2		Internal oblique and transversus abdominis	Skin of gluteal region and skin in pubic region	
		Internal oblique and transversus abdominis	Gives off femoral cutaneous branches to Skin of upper medial thigh. Skin over root of penis and anterior scrotum or mons pubis and labium majus Genital branch which enters inguinal canal through deep inguinal ring and supply scrotum of labium majus Skin of upper anterior thigh (femoral branch)	
		Male cremasteric muscle		
Lateral cutaneous nerve of thigh	L2, L3	N/A	Skin on lateral thigh to knee	
Obturator nerve	12-14	Obturator externus, gracilis and adductor muscles	Skin on medial aspect of thigh	
Femoral nerve	L2-L4	Iliacus, pectineus, sartorius and quadriceps femoris	Skin on anterior thigh and medial leg	

<u>Note:</u> Sub-costal nerve: (T12) Largest thoracic spinal nerve originates from anterior ramus of spinal nerve T12, Innervates external oblique, internal oblique, transversus abdominus, rectus abdominus and pyramidalis muscle

6/15

A 30-year-old male presents to the ED with history of previous anaphylactic reaction to vaccines. Which one of the following vaccines is contraindicated and if given will likely precipitate acute immune reactions?

A. Hepatitis A

B. IPV

C. Hepatitis B



D. Rabies vaccine

E. Varicella Vaccine



live vaccines are contraindicated in anyone who has had a severe allergic reaction to a previous dose of the same vaccine or from a different vaccine containing a component of the live vaccine, such as albumin.

Other contraindications of live vaccine include:

- Pregnancy
- People who are immunocompromised include those who:
- Are receiving high-dose immunosuppressive therapy, including biologic or targeted synthetic disease-modifying anti-rheumatic drugs (bDMARDs or tsDMARDs) or oral corticosteroids (≥20 mg per day of prednisolone equivalent dose)
- Are receiving chemotherapy or radiation.
- have malignancies related to the immune system such as lymphoma, leukaemia or Hodgkin disease, even if they are not receiving active treatment
- Have AIDS or symptomatic HIV
- Have similar immunocompromising conditions due to a disease or treatment.
- **Note:** Anaphylaxis after vaccination is rare in all age groups and Anaphylactic reaction can occur with both live and killed vaccine, but reportedly yellow fever vaccine and covid-19 vaccine has some greater risk than others.



7/15

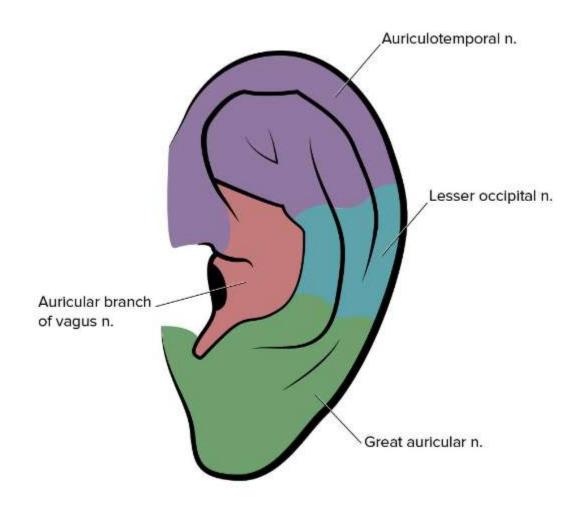
A 45-year-old woman who has recently undergone surgery to remove a tumor located near her parotid gland. The surgery was successful, but she has been experiencing post-operative discomfort and numbness in the area around her ear, particularly in her ear lobule and along her jawline. Which one of the following nerves is likely affected?

- A. Greater petrosal nerve
- B. Lesser occipital nerve
- C. Marginal mandibular nerve
- D. Greater auricular nerve

E. Auriculotemporal nerve

Greater auricular nerve cutaneous branch of the cervical plexus provides sensory innervation to ear lobule, skin over the parotid gland and mastoid process of the temporal bone. Pain of parotitis and during ear piercing is due to innervation of greater auricular nerve.





Anatomy of sensory nerves in the external ear.

8/15

A 60-year-old individual experiences a sudden and severe injury to their neck while participating in a sporting event. Shortly after the incident, they find they are unable to move their legs and have lost the ability to feel pain or temperature



sensation below their waist. However, he retains some sensation for light touch and proprioception and can still move their arms and hands. Based on these symptoms, which one of the following arteries is likely infarcted?

- A. Posterior cerebral artery
- B. Medial cerebral artery
- C. Anterior cerebral artery
- D. Anterior spinal artery
- E. Posterior spinal artery

Anterior cord syndrome results from occlusion of anterior spinal artery characteristically resulting in motor paralysis below the level of the lesion as well as the loss of pain and temperature at and below the level of the lesion. There is preservation of dorsal column function (fine touch, vibration sense, and proprioception).

Spinal cord syndrome (High Yield)



QUIZ: 32	MRCEM EXPERT
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Card syndrome	Mechanism	Tract injury	Symptoms
Complete cord transection	Major trauma	All tracts	 Death if c1-c3 injured. Quadriplegia Paraplegia Complete sensory loss below lesion Urinary and faecal continence
Brown- Séquard syndrome	Hemitransection or unilateral compression of the cord	All tract on one side	 Ipsilateral hemiparesis Ipsilateral loss of proprioception, vibration and fine touch sensation Contralateral loss of crude touch, pain and temperature sensation
Central cord syndrome	usually seen in older patients with preexisting cervical spondylosis who sustain a hyperextension injury	Corticospinal tract and spinothalamic tract	Bilateral motor loss Varying degree of sensory loss Greater loss in upper limb than lower limb Greater loss of motor in upper limb than sensory function

Anterior cord syndrome	Direct anterior cord compression Flexion of cervical spine Thrombosis of anterior spinal artery	Corticospinal, spinothalamic and spinocerebellar tracts	 Bilateral motor loss Bilateral loss of crude touch, pain and temperature sensation
Posterior cord syndrome	hyperextension injury associated with vertebral arch fractures or penetrating trauma to the back	Dorsal column	 Bilateral loss of proprioception, vibration and light touch sensation

9/15

Which one of the following is midbrain structure?

A. Pons



B. Carpus callosum

C. Medulla

D. Colliculi

E. Cerebral aqueduct

Brainstem:

Consists of midbrain, pons and medulla.

Mid brain:

• Smallest of the three regions lies predominantly in the posterior cranial fossa.

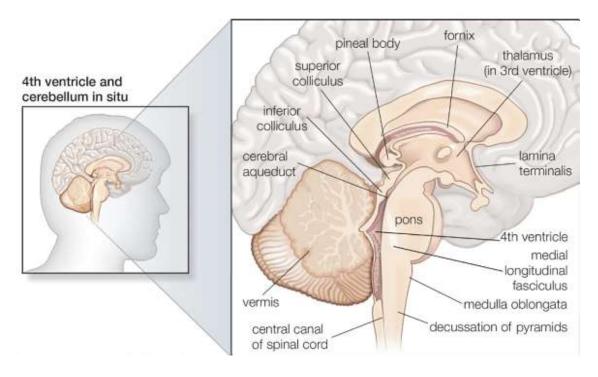
It can be divided into two main parts:

- <u>Tectum:</u> located posterior to the cerebral aqueduct The tectum houses four rounded prominences named **colliculi** (collectively the corpora quadrigemina) which sit directly inferior to the pineal gland. The colliculi are separated by the cruciform sulcus; there are two superior and two inferior colliculi.
- <u>Paired cerebral peduncles:</u> located anteriorly and laterally extend from the cerebral hemispheres to converge as they meet the pons. They are separated anteriorly in the midline by the interpeduncular fossa
- The oculomotor nerve (CNIII) is seen exiting from between the peduncles while the optic tract runs around the superior border of the



midbrain.

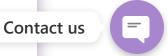
Note: Dopaminergic neurons are essential for controlling key functions of the brain, such as voluntary movement, reward processing, and working memory. The largest populations of these neurons sit within the midbrain in substantia nigra.



Vasculature of the mid brain:

The midbrain receives vascular supply from the basilar artery, and its branches. The major vessels are:

- Posterior cerebral artery and its peduncular branch
- Superior cerebellar artery
- Posterior choroidal artery
- Interpeduncular branches of the basilar artery



10 / 15

A 23-year-old man is involved in a fight outside a nightclub. He is cut across the face with the edge of a broken glass. Upon examination he has a lesion in the facial nerve, and he is unable to close his eyes. Which one of the following muscles is likely affected?

۸.	Levator	pa	lpebrae	superior
4.0		-		0000000

B. Procerus

C. Corrugator supercilli

D. Superior tarsal muscle

E. Orbicularis oculi



Orbicularis oculi

- Orbicularis oculi (Closes the eyelids): The orbicularis oculi muscle is innervated by the branches of facial nerve and closes the eyelids. Loss of function of the orbicularis oculi causes an inability to close the eyelids tightly and a drooping of the lower eyelid (ectropion) resulting in spillage of tears. This leads to drying of the cornea. The orbicularis oculi muscle has three distinct parts: palpebral, lacrimal and orbital part.
- Actions:

• Palpebral part: gently closes the eyelids.





- Lacrimal part: involved in the drainage of tears.
- Orbital part: tightly closes the eyelids.
- Other muscles: (High Yield)
- The levator palpebrae superioris muscle: innervated by the oculomotor nerve and acts to raise the upper eyelid. Loss of function of the levator palpebrae superioris muscle results in a **complete ptosis**.
- The superior tarsal muscle is innervated by postganglionic sympathetic fibres from the superior cervical ganglion, which helps to maintain upper eyelid opening. Loss of function of the superior tarsal muscle results in a partial ptosis.
- <u>Tarsal plate:</u> The tarsal plates are located deep to the orbicularis oculi muscle. There are two plates; the superior tarsus (upper eyelid) and inferior tarsus (lower eyelid).
- The tarsal plate in the eyelid provides structural support, serves as an attachment site for muscles, houses meibomian glands, and helps distribute tears, distributed tear film can help flush away foreign particles and potential pathogens, reducing the risk of infection.
- In the tarsal plates lie the Meibomian glands (also known as tarsal glands). These are a specialised type of sebaceous gland that secretes an oily substance onto the eye to slow the evaporation of the eye's tear film. The oily substance also prevents the eyelids from sticking together when closed.
- <u>Clinical pearls:</u> Dysfunction in these glands, often due to blockages or inflammation, can lead to reduced tear stability and dry eye.

<u>Facial nerve terminal branches in parotid gland:</u> (<u>High Yield</u>)

• The cervical branch: innervating the platysma muscle.



- The temporal branch: innervating muscles in the temple, forehead muscles (frontalis) and supraorbital areas (upper half of orbicularis oculi muscle)
- The zygomatic branch: innervating muscles in the infraorbital area (Lower half of orbicularis oculi muscle), the lateral nasal area and the upper lip
- The buccal branch: innervating muscles in the cheek and upper lip
- The marginal mandibular branch: innervating muscles of the lower lip and chin

High yield:

- The chorda tympani branch of the facial nerve supplies taste sensation to the anterior 2/3 of the tongue.
- In the anterior 2/3, general sensation is supplied by the trigeminal nerve (CNV). Specifically, the lingual nerve, a branch of the mandibular nerve (CN V3).
- The posterior 1/3 of the tongue both touch and taste are carried by the glossopharyngeal nerve (CNIX)

11 / 15

A 65-year-old man with high blood pressure and high cholesterol was brought into the ED with complaint of motor and sensory weakness in his right lower limb. Along with that he had trouble speaking and apraxia. Which one of the cerebral arteries is likely occluded?

A. Posterior cerebral artery



B. Anterior cerebral artery



C. Medial cerebral artery

D. Posterior spinal artery

E. Anterior spinal artery

Left ACA is occluded which will result in right (Contralateral lower limb motor and sensory weakness) along with dysarthria, dysphasia, apraxia and urinary incontinence.

High Yield: Clinical effects of occlusion of cerebral arteries

ĺ	Blood vessel	Clinical effects of occlusion of cerebral arteries		
	Anterior cerebral artery	 <u>Frontal lobe</u>: contralateral weakness in lower limb, dysarthria, dysphasia, apraxia and urinary incontinence <u>Parietal lobe</u>: contralateral somatosensory loss in the lower limb 		
Posterior cerebral artery hemianopia with macular sparing, cortical blindness (if bilateral) • Temporal lobe: memory deficit		hemianopia with macular sparing, cortical blindness (if bilateral) • Temporal lobe: memory deficit • Occipitotemporal region: prosopagnosia, and		
	Middle cerebral artery	 Frontal lobe: contralateral weakness (face/arm greater than leg), conjugate deviation of the eyes to affected side, expressive dysphasia. Temporal lobe: deafness (if bilateral), receptive dysphasia, auditory illusions and hallucinations, contralateral superior quadrantanopia. Parietal lobe: loss of sensory discrimination, hemineglect, apraxia, contralateral inferior quadrantanopia (RECALL) 		

12 / 15 Contact us

Which one of the following vaccines is contraindicated in pregnancy?

A. Pertussis vaccine

B. Split virion

C. Injectable Polio vaccine

D. LAIV 🎻

E. Rabies vaccine

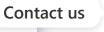
Live attenuated vaccines are contraindicated in immunosuppression, pregnant woman and anaphylactic reaction to vaccine. While we give inactivated influenza and pertussis vaccine as normal selected immunisation in pregnant woman. Refer to Uk immunisation schedule chart.

Live attenuated vaccines used in the UK schedule: (High Yield)

- Rotavirus vaccine
- MMR vaccine
- Nasal flu vaccine (LAIV)
- Shingles vaccine
- Chickenpox vaccine (Varicella vaccine)
- BCG vaccine against TB

Live travel vaccines used in the UK:

• Yellow fever vaccine





Oral typhoid vaccine (not the injected vaccine)

Whole killed' vaccines used in the UK schedule:

- Inactivated polio vaccine or IPV
- Pertussis vaccine in pregnancy
- Some inactivated flu vaccines which are described as 'split virion'
- Hepatitis A vaccine (special groups only)

Examples of 'whole killed' travel vaccines used in the UK:

- Rabies vaccine
- Japanese encephalitis vaccine

13 / 15

A 21-year-old girl presents with double vision. She is holding her head tilted to the right-hand side. On examination of her eye movements, you note that both eyes can look normally to the left but on looking to the right, her right eye cannot turn outwards past the midline. The left eye is unaffected when looking to the right. Which one of the following nerves is likely affected?

A. Right abducent nerve



B. Right oculomotor nerve

C. Right trochlear nerve

D. Left abducent nerve





E. Right optic nerve

Paralysis of right lateral rectus muscle (LR-6) resulted due to palsy of 6th cranial nerve. Patient will be unable to abduct the eye and will result in the affected eye being unable to turn outwards.

High Yield:

Movements of the eyeball (Extra ocular muscles)

All the extraocular muscles are innervated by oculomotor nerve except
 LR-6 and S0-4

Muscle	Nerve innervation	Function	
Superior rectus	Oculomotor nerve	Elevation and medial rotation of eyeball	
Inferior rectus	Oculomotor nerve	Depression, lateral rotation and adduction	
Medial rectus	Oculomotor nerve	Adduction	
Lateral rectus (LR6)	Abducent nerve	Abduction of eyeball (Horizontal diplopia (Recall)	
Superior oblique (SO4)	Trochlear nerve	Depression, abduction and medial rotation of eyeball (Vertical diplopia)	
Inferior oblique	Oculomotor nerve	Elevation, abduction and lateral rotation	

14 / 15

A 35-year-old man down a flight of stairs and suffers a skull fracture. The fracture causes damage to the mandibular nerve (V3) and has loss of sensation in preauricular area and outer tympanic membrane. Which one of the following nerves is likely affected?

A. Inferior alveolar nerve

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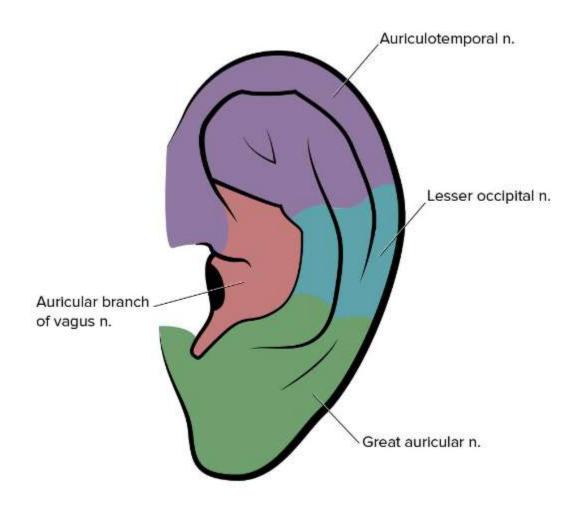
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C. Long ciliary nerve

D. Buccal nerve

E. Lingual nerve

Skin around the air, external auditory meatus and tympanic membrane innervated by auriculotemporal branch of mandibular division.



Anatomy of sensory nerves in the external ear.

15 / 15

A 20-year-old male presents to the ED with a deep contaminated wound in his hand waiting for debridement tomorrow. He tells you that he had a full course of



vaccinations as a child. What would you advise him regarding tetanus prophylaxis?

A. He should have his tetanus antibodies checked before deciding on a booster

B. He should have a tetanus booster and human tetanus immunoglobulin in the same site in his left arm

C. He should have a tetanus booster

D. There is no need for tetanus toxoid and vaccine as he is fully vaccinated



E. He should have a tetanus booster in his left arm and human tetanus immunoglobulin in his right arm

Tetanus prone wound:

Clean wounds are defined as:

wounds less than 6 hours old, non-penetrating with negligible tissue damage

Tetanus-prone wounds include:

- puncture-type injuries acquired in a contaminated environment and likely therefore to contain tetanus spores e.g. gardening injuries
- compound fractures
- wounds or burns with systemic sepsis.

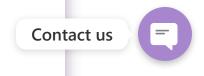


• certain animal bites and scratches

High risk tetanus-prone wound:

- heavy contamination with material likely to contain tetanus spores e.g.
 soil, manure
- wounds or burns that show extensive devitalised tissue.
- wounds or burns that require surgical intervention that is delayed for more than six hours are high risk even if the contamination was not initially heavy

Tetanus immunization schedule:



Immunisation Status		Immediate treati	Later (5)	
	Clean wound ¹	Tetanus Prone	High risk tetanus prone	treatment
Those aged 11 years and over, who have received an adequate priming course of tetanus vaccine² with the last dose within 10 years Children aged 5-10 years who have received priming course and preschool booster Children under 5 years who have received an adequate priming course	None required	None required	None required	Further doses as required to complete the recommended schedule (to ensure future immunity)
Received adequate priming course of tetanus vaccine ² but last dose more than 10 years ago Children aged 5-10 years who have received an adequate priming course but no preschool booster Includes UK born after 1961 with history of accepting vaccinations	None required	Immediate reinforcing dose of vaccine	Immediate reinforcing dose of vaccine One dose of human tetanus immunoglobulin ³ in a different site	Further doses as required to complete the recommended schedule (to ensure future immunity)
Not received adequate priming course of tetanus vaccine ² Includes uncertain immunisation status and/ or born before 1961	Immediate reinforcing dose of vaccine	Immediate reinforcing dose of vaccine One dose of human tetanus immunoglobulin ³ in a different site	Immediate reinforcing dose of vaccine One dose of human tetanus immunoglobulin ³ in a different site	

More easy to remeber:



Up to date immunization status and last dose less than 10 years	No tetanus immunoglobin or vaccine
Up to date immunization status and last dose greater than 10 years ago	Clean wound: NO IG or vaccine High risk wound: Both IG and vaccine
No previous immunization record or uncertain immunization or born before 1961)	Clean wound: immediate reinforcing dose of vaccine High risk wound: Both immediate IG and vaccine

Clostridium Species (High Yield)

All the Clostridium species are Gram +Ve spore forming obligate anaerobes.

Clostridium Tetani	Gram +Ve rod produces exotoxin tetanospasmin causes tetanus.		
Clostridium Difficile	Gram +Ve rod spore forming, transmitted by fecal-oral route produces Toxin A (enterotoxin) and Toxin B (cytotoxin) causes Pseudomembranous colitis. Note: Alcohol gel is not effective against spores of clostridium difficile, instead use soap and water		
Clostridium Perfringens	Gram +Ve rod Spore-exotoxin causes Gas gangrene.		
Clostridium botulinum	Gram +Ve rod spore- forming, produces exotoxin botulinum. Botulinum toxin, the most potent of the neurotoxins, produces paralysis by blocking presynaptic release of the neurotransmitter (acetylcholine) at the neuromuscular junction.		

← Previous

Next →

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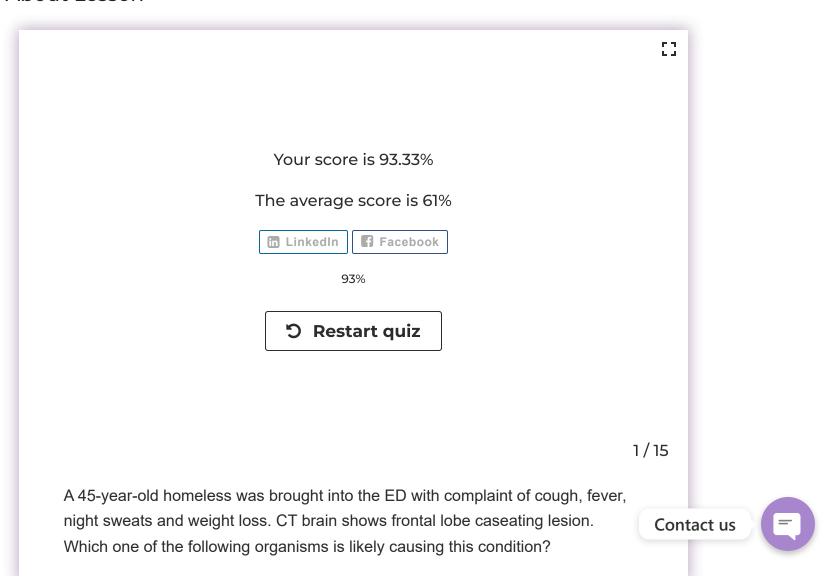
Mrcem Primary Complete Course ,High Yield Stuff and Similar to Previous Exam Questions With Explanation (For Diet 2)



Overview •

E Comments

About Lesson



- A. Measles virus
- B. Klebsiella pneumoniae
- C. Mycoplasma pneumoniae
- D. Streptococcus pneumoniae
- E. Mycobacterium tuberculosis



The Ghon focus is a primary lesion caused by tuberculosis that develops in the lung of previously unaffected individuals. It represents a calcified caseating granuloma. It typically appears in the middle-third of the lung (the lower part of the upper lobe or upper part of the lower lobe).

TB can affect various organs in the body, including the lungs, lymph nodes, and even the central nervous system. In cases of central nervous system TB, the frontal lobe of the brain can be affected, leading to the formation of caseating lesions and potentially causing neurological symptoms.

High Yield:

Mycobacterium Tuberculosis

Acid fast bacilli Causes tuberculosis transmitted via respiratory aerosol and characterized by chronic granulomatous inflammation.



Clinical Features:

- Fever, Night sweats and weight loss
- Persistent cough for more than 3 weeks
- Hemoptysis
- Hilar lymphadenopathy

Pathophysiology:

The Ghon focus is a primary lesion caused by tuberculosis that develops in the lung of previously unaffected individuals. It represents a **calcified caseating granuloma**. It typically appears in the middle-third of the lung (the lower part of the upper lobe or upper part of the lower lobe).

Diagnosis:

- sputum samples Microscopy with Z-N (Ziehl-Nelsen stain) shows acid fast bacilli.
- In the case of active pulmonary TB, a patient can have crepitations, and bronchial breath sounds, and specially over upper lobes x-ray cavitations or consolidations.
- The Mantoux test is a widely used test for latent TB: It involves injecting a small amount of a substance called PPD tuberculin into the skin of your forearm. It's also called the tuberculin skin test (TST).

2/15

A 50-year-old farmer was presented to the emergency department after sustaining an injury to his thigh while working in his farm's field. He had accidentally stepped on a rusty piece of metal. The wound was deep and dirty, but he initially did not seek immediate medical attention. Over the course of the





next 48 hours, he experienced increasing pain, swelling, development of foul-smelling and crepitus noted in his thigh with rapid spread. Which one of the following organisms most likely caused this condition?

A. Staph Aureus

B. Clostridium botulinum

C. Clostridium perfringens

D. Clostridium tetani

E. Clostridium difficile

Gas Gangrene: Caused by Clostridium perfringens.

Clinical features

- pain
- Oedema or swelling
- skin discoloration
- crepitus (gas gangrene)
- diminished pedal pulses and ankle-brachial index (ischaemic gangrene)
- low-grade fever and chills (infectious gangrene)

High Yield:

Clostridium Species





All the Clostridium species are Gram +Ve spore forming obligate anaerobes.

Clostridium Tetani	Gram +Ve rod produces exotoxin tetanospasmin causes tetanus.		
Clostridium Difficile	Gram +Ve rod spore forming, transmitted by fecal-oral route produces Toxin A (enterotoxin) and Toxin B (cytotoxin) causes Pseudomembranous colitis. Note: Alcohol gel is not effective against spores of clostridium difficile, instead use soap and water		
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3/15

A 26-year-old patient presents to the Emergency Department with headache, dizziness and tachycardia. He is known asthmatic and is on a salbutamol inhaler and a theophylline. He had been seen in the Emergency Department a few days before and prescribed an antibiotic. Which antibiotic was most likely given which has caused her symptoms?

- A. Doxycycline

 B. Trimethoprim

 C. Amoxycillin
- D. Cephalexin

E. Ciprofloxacin



Ciprofloxacin is enzyme inhibitor decrease hepatic clearance of concomitant administrated drugs and increase their pharmacologic effects typically results in toxic effects of drugs.

High Yield:

Cytochrome P450 enzyme inducer drugs increase rate of metabolism and hepatic clearance of concurrently administrated drugs which typically results in decreased pharmacologic effects While enzyme inhibitor drugs decrease hepatic clearance and increase pharmacologic effects.

Enzyme inducers	Enzyme inhibitors
 Increasing the rate of metabolism and hepatic clearance of concurrently administered drugs, which typically results in a decreased pharmacologic effect. 	Decrease hepatic clearance and increase pharmacologic effect.
Useful mnemonic SCRAP GP Sulphonylureas Carbamazepine Rifampicin Alcohol Phenytoin (Recall) Griseofulvin Phenobarbital	Sodium valproate Isoniazid Cimetidine Ketoconazole Fluconazole Alcohol Chloramphenicol Erythromycin Sulfonamides Ciprofloxacin Omeprazole Metronidazole



4/15

A 30-year-old man presents to the ED with sports injury. Further evaluation reveals fracture of bicipital groove of humerus and associated bicep tendon damage. Which one of the following ligaments is likely to be disrupted?

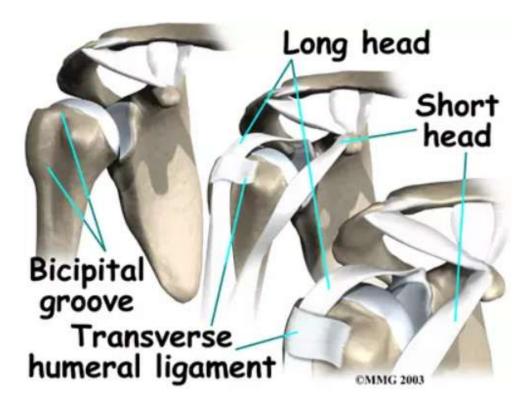
- A. Coracoacromial ligament
- B. Glenohumeral ligament
- C. Coracohumeral ligament
- D. Transverse humeral ligament



E. Coraco-clavicular ligament

The tendon of the long head of the biceps runs in front of the humeral head. The tendon passes within the bicipital groove of the humerus and is held in place by the transverse humeral ligament.





The shoulder Joint (High Yield)

Type: synovial ball and socket joint

Shoulder joint is formed by the articulation of the **head** of the humerus with the **glenoid cavity** of the scapula

Ligaments of the shoulder joint:

In the shoulder joint, the ligaments play a key role in stabilizing the bony structures.

• **Glenohumeral ligaments** (superior, middle and inferior) They act to stabilize the **anterior aspect** of the joint. They are the main source of



- stability for the shoulder, holding it in place and preventing it from dislocating anteriorly.
- **Coracohumeral ligament:** It supports the superior part of the joint capsule.
- Transverse humeral ligament: This ligament spans the distance between the two tubercles of the humerus. It holds the tendon of the long head of the biceps in the intertubercular groove or bicipital groove.
- Coraco-clavicular ligament: This ligament composed of the trapezoid and conoid ligaments and runs from the clavicle to the coracoid process of the scapula. They work alongside the acromioclavicular ligament to maintain the alignment of the clavicle in relation to the scapula.
- Coracoacromial ligament. This ligament runs between the acromion and coracoid process of the scapula it forms the coraco-acromial arch.
 This structure overlies the shoulder joint, preventing superior displacement of the humeral head.

5 / 15

You examine a patient in the Emergency Department and find that there is visual loss on the left side of the vertical midline in both eyes. Occlusion of what type of blood vessel is most likely to be the cause of this clinical finding?

A. Posterior cerebral artery



B. Posterior inferior cerebellar artery



C. Anterior communicating artery

D. Middle cerebral artery



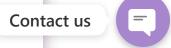
E. Anterior cerebral artery

- Visual loss on the left side of the vertical midline in both eyes" refers to a specific type of visual field defect known as homonymous hemianopia
- Visual deficits, including homonymous hemianopia, are more commonly associated with infarction or ischemia involving the Posterior Cerebral Artery (PCA) territory.

High Yield:

Clinical effects of occlusion of cerebral arteries

	Blood vessel	Clinical effects of occlusion of cerebral arteries	
	Anterior cerebral artery	 <u>Frontal lobe</u>: contralateral weakness in lower limb, dysarthria, dysphasia, apraxia and urinary incontinence <u>Parietal lobe</u>: contralateral somatosensory loss in the lower limb 	
)	Posterior cerebral artery	 Occipital lobe: contralateral homonymous hemianopia with macular sparing, cortical blindness (if bilateral) Temporal lobe: memory deficit Occipitotemporal region: prosopagnosia, and color blindness 	
Middle cere artery	Middle cerebral artery	 Frontal lobe: contralateral weakness (face/arm greater than leg), conjugate deviation of the eyes to affected side, expressive dysphasia. Temporal lobe: deafness (if bilateral), receptive dysphasia, auditory illusions and hallucinations, contralateral superior quadrantanopia. Parietal lobe: loss of sensory discrimination, hemineglect, apraxia, contralateral inferior quadrantanopia (RECALL) 	



6/15

A 23-year-old man presents with a crush injury to his wrist and thumb. On further evaluation ulnar nerve injury was suspected. Which one of the following muscles is likely affected?

B. Adductor pollicis	4

C. flexor pollicis brevis

D. Flexor pollicis longus

E. opponens pollicis

Anatomical Course of Ulnar Nerve:

Arises from the medial cord of the brachial plexus, runs down the
medial aspect of the arm, pierces the medial intermuscular septum at
the middle of the arm, and descends together with the superior ulnar
collateral branch of the brachial artery. It then Descends behind the
medial epicondyle in a tunnel (cubital tunnel), where it is readily
palpated and most commonly injured. It may be damaged by a
fracture of the medial epicondyle. When irritated, it causes funny
bone symptoms of pain, numbness, and tingling in the medial elbow
forearm, and digits.



• It then enters the forearm by passing between the two heads of the flexor carpi ulnaris and descends between the flexor carpi ulnaris and gives rise to following **branches in forearm.**

Muscular branch	Forearm	Flexor carpi ulnaris, medial half of flexor digitorum profundus
Palmar cutaneous branch	Forearm	Skin of medial half of palm
Dorsal cutaneous branch	Forearm	innervates the dorsal surface of the medial one and a half fingers, and the associated dorsal hand area.

Ulnar nerve branches in hand

• Enters the hand superficial to the flexor retinaculum and lateral to the pisiform bone, where it is vulnerable to damage from cuts or stab wounds and gives rise to following branches in hand.

Deep branch Hand Th		Intrinsic hand muscles are innervated by the deep branch of the ulnar nerve: • Hypothenar muscles (flexor digiti minimi brevis, abductor digiti minimi, opponens digiti minimi) • Medial two lumbricals • Adductor pollicis • Palmar and dorsal interossel of the hand The palmaris brevis is an exception to this rule and is innervated by the superficial branch of the ulnar nerve. The other muscles of the hand (lateral two lumbricals and the thenar eminence) are innervated by the median nerve.
Superficial branch	Hand	Palmaris brevis Skin of palmar surface of medial one and a half fingers

7 / 15

A 12-year-old boy presents with clinical complaints of dark urine, facial swelling, and elevated blood pressure following a recent streptococcal throat infection. Further evaluation suggests acute glomerulonephritis. What type of immune complex is commonly associated with kidney damage in this post-streptococcal glomerulonephritis?





B. igE	
C. igA	
D. igD	
E. T cells	

- Post-streptococcal glomerulonephritis is a specific type of Acute glomerulonephritis that occurs 1-2 weeks after infection, typically associated with the deposition of IgG immune complexes in the glomeruli, leading to inflammation and kidney damage. An infection by a nephritogenic strain of group A beta-hemolytic streptococcus bacteria initiates a **type III hypersensitivity reaction**, where immune complexes are formed composed of antigens and antibodies, most often igG but in 50% cases igM also.
- Compliment levels C3 are high

Note: (High Yield)

- **igA nephropathy** also known as berger disease most common cause of nephritic syndrome occurs 1-2 days after infection (Gastrointestinal, respiratory or UTI) typically associated with Henoch Schönlein purpura, Celiac disease and liver disease.
- Compliment levels C3 are low.
- <u>Goodpasture's Syndrome</u> is a type-II hypersensitivity disease caused by anti-basement membrane antibodies against collagen in glomerular and pulmonary capillaries. It begins with hemoptysis and ends with renal failure.



• Clinical features: Hemoptysis, dyspnea and possible respiratory failure.

8 / 15

A 12-year-old boy presents with albuminuria and complains of dark urine, facial swelling, and elevated blood pressure following a recent streptococcal throat infection. Further evaluation suggests acute glomerulonephritis. Which kidney structure is most likely responsible for this condition?

- A. Damage to bowman's capsule
- B. Ascending limb of loop of Henle
- C. Damage to glomerulus
- D. Damage to Collecting duct
- E. Damage to Proximal convoluted tubule

In acute glomerulonephritis, the damage occurs primarily in the glomerulus, which is responsible for filtering blood and maintaining a selective filtration barrier. Damage to the glomerulus can lead to increased permeability, allowing albumin to pass through and appear in the urine, **resulting in albuminuria.**



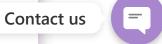
9/15

A 30-year-old man presents to the ED with sports injury. Which one of the following ligaments is torn in fracture of coronoid process of ulna?

- A. Radial collateral ligament
- B. Coracoacromial ligament
- C. Medial collateral ligament
- D. Annular ligament
- E. Coracohumeral ligament
- The ulnar collateral ligament referred as Medial collateral ligament (MCL) of the elbow originates from the medial epicondyle and attaches to the coronoid process and olecranon of the ulna.

Ligaments of the elbow joint: (High Yield)

- The radial collateral ligament is found on the lateral side of the joint, extending from the lateral epicondyle and blending with the annular ligament.
- The ulnar collateral ligament referred as Medial collateral ligament (MCL) of the elbow originates from the medial epicondyle and attaches to the coronoid process and olecranon of the ulna.
- Annular ligament: Annular ligament stabilizes the elbow joint and is strong band of fibers that encircles the head of the radius and holds it



in contact with the radial notch of the ulna

Clinical pearl:

- Elbow dislocation: Mostly posterior occurs due to fall on hand with the elbow flexed
- Complications: The ulnar collateral ligament is usually torn and there can also be ulnar nerve involvement.

10 / 15

A 23-year-old man presents with a crush injury to his hand. Which one of the following muscles will remain intact in C8-T1 nerve root injury from high lesions?

A. Flexor pollicis longus



- B. Abductor digiti minimi
- C. Flexor pollicis brevis
- D. Flexor digiti minimi brevis
- E. Flexor carpi ulnaris
- The anterior interosseous nerve is a terminal motor branch of the median nerve arising from C5-T1 nerve roots. It supplies the deep muscles of the anterior forearm which includes flexor pollicis longus, lateral half of flexor digitorum profundus and pronator quadratus.
- The recurrent branch of median nerve (C8, T1) is a small muscular branch of median nerve. In order to remember the muscles innervated



by the recurrent branch, you can use mnemonic LOAF to recall the motor innervation of the median nerve. This stands for:

- L: lateral two lumbricals
- O: opponens pollicis
- A: abductor pollicis brevis
- F: flexor pollicis brevis (superficial head)

Ulnar Nerve: (High Yield)

- While other muscles mentioned in options are innervated by ulnar nerve (C8-T1)
- The **ulnar nerve** arises from the brachial plexus within the axilla region. It is a continuation of the medial cord and contains fibers from spinal roots C8 and T1.

Nerve roots	C8 – T1		
Plexus cords	Medial cord		
Motor Supply	 Two muscles of the anterior forearm flexor carpi ulnaris and media half of flexor digitorum profundus Intrinsic muscles of the hand (apart from the thenar muscles and two lateral two lumbricals) 		
Sensory supply	Medial half of palm, palmar and dorsal surface of medial one and a half fingers and medial dorsum of hand		

Anatomical Course of Ulnar Nerve:

Arises from the medial cord of the brachial plexus, runs down the
medial aspect of the arm, pierces the medial intermuscular septum at
the middle of the arm, and descends together with the superior ulnar
collateral branch of the brachial artery. It then Descends behind the
medial epicondyle in a tunnel (cubital tunnel), where it is readily
palpated and most commonly injured. It may be damaged by a



fracture of the medial epicondyle. When irritated, it causes funny bone symptoms of pain, numbness, and tingling in the medial elbow, forearm, and digits.

• It then enters the forearm by passing between the two heads of the flexor carpi ulnaris and descends between the flexor carpi ulnaris and gives rise to following **branches in forearm.**

Muscular branch	Forearm	Flexor carpi ulnaris, medial half of flexor digitorum profundus
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Ulnar nerve branches in hand

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Deep branch	Hand	Intrinsic hand muscles are innervated by the deep branch of the ulnar nerve: • Hypothenar muscles (flexor digiti minimi brevis, abductor digiti minimi, opponens digiti minimi) • Medial two lumbricals • Adductor pollicis • Palmar and dorsal interossel of the hand The palmaris brevis is an exception to this rule and is innervated by the superficial branch of the ulnar nerve. The other muscles of the hand (lateral two lumbricals and the thenar eminence) are innervated by the median nerve.
Superficial branch	Hand	Palmaris brevis Skin of palmar surface of medial one and a half fingers

Clinical Pearls:

Froment's sign: Froment's sign is a test for ulnar nerve palsy specifically paralysis of the adductor pollicis:

• Patient is asked to hold a piece of paper between thumb and index finger as paper is pulled away, patient will flex thumb at inter-



phalangeal joint to maintain hold, this sign tests the function of adductor pollicis muscle which is supplied by the **ulnar nerve**.

• A positive test is when the patient is unable to adduct the thumb. Claw hand:

Injury to the ulnar nerve is commonly caused by a fracture of the medial epicondyle and results in a claw hand, in which the ring and little fingers are hyperextended at the metacarpophalangeal joints and flexed at the interphalangeal joints.

- Partial claw hand deformity is due to an isolated ulnar nerve injury.
- Complete claw hand deformity: Involves all digits and results from combined ulnar and median nerve injury.

11 / 15

A 78-year-old man requires treatment with an antibiotic. He takes warfarin for atrial fibrillation. What antibiotic is the safest choice for this patient?

A. Ciprofloxacin

B. Cefalexin

C. Co-trimoxazole

D. Doxycycline



E. Clarithromycin

- Antibiotics considered to be high-risk for interaction with warfarin include Co-trimoxazole, ciprofloxacin, levofloxacin, metronidazole, fluconazole, azithromycin, and clarithromycin.
- Low-risk antibiotics include clindamycin and cephalexin.

High Yield:

Monitoring: Both PT and aPTT are prolonged after warfarin administration but PT is more prolonged. Warfarin therapy is typically monitored using the prothrombin time (PT) test along with the International Normalized Ratio (INR), rather than the activated partial thromboplastin time (aPTT) test.

Patient on warfarin therapy

- Managing the patients with increased INR and bleeding
- If INR> 8 and no bleeding = Phytomenadione orally
- If INR> 8 and minor bleeding = Phytomenadione Iv
- If INR> 8 and major bleeding = Phytomenadione Iv and dried prothrombin complex (Recall)
- If INR 5-8 and no bleeding = Withhold warfarin
- If INR 5-8 and minor bleeding = Phytomenadione Iv

12 / 15

A 26-year-old man has suffered a fracture of mid shaft of humerus. On examination he has extensor weakness of the wrist and metacarpophalangeal joints, which has resulted in wrist drop and inability to grip with his right hand.





Extension of the elbow is preserved. Where would you see sensory loss in this injury?

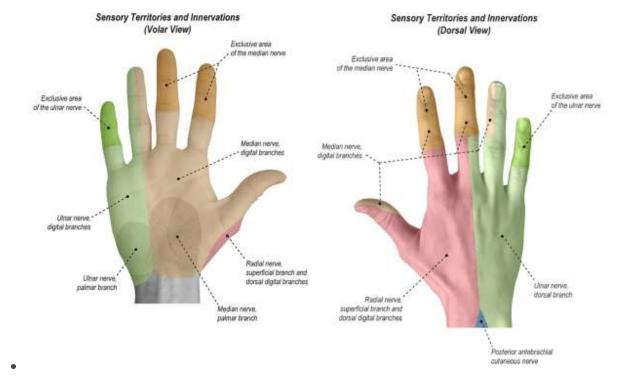
- A. Lateral palm of hand
- B. Palmar surface of lateral three fingers
- C. Medial dorsal hand
- D. Dorsum of hand little finger
- E. Dorsum of hand 1st web space



- Mid Shaft humerus fracture and wrist drop goes with radial nerve injury.
- Radial nerve Superficial branch (sensory): contributes to the cutaneous innervation of the skin of dorsal hand and lateral three and half fingers.



11/18/23, 11:38 AM QUIZ : 33 | MRCEM EXPERT



radial nerve injury

Radial Nerve: (High Yield)

The radial nerve is the terminal continuation of the **posterior cord** of the brachial plexus.

Nerve Roots	C5 – T1	
Plexus cords	Posterior cord	
Motor Supply Triceps brachii Muscles of posterior compartment of forearm		
Sensory supply Innervates most of the skin of the posterior forearm, the late of the dorsum of the hand, and the dorsal surface of the late and a half digits.		



Radial nerve arises from the posterior cord and the largest branch of the brachial plexus.

The nerve arises in the axilla region, where it is situated posteriorly to the axillary artery, descends posteriorly between the long and medial heads of the triceps, after which it passes inferolaterally with the profunda brachii artery in the spiral (radial) groove on the posterior surface of the humerus between the medial and lateral heads of the triceps. Pierces the lateral intermuscular septum to enter the anterior compartment and descends anterior to the lateral epicondyle between the brachialis and brachioradialis muscles to enter the cubital fossa, where it divides into superficial and deep branches.

- Deep branch (motor): innervates the muscles in the posterior compartment of the forearm and continues as posterior interosseous nerve
- **Superficial branch** (sensory): contributes to the cutaneous innervation of the skin of dorsal hand and lateral three and half fingers.

Other branches which give cutaneous innervation to skin of upper limb.

- Lower lateral cutaneous nerve of arm: Innervates the lateral aspect of the arm, inferior to the insertion of the deltoid muscle.
- **Posterior cutaneous nerve of arm:** Innervates the posterior surface of the arm.
- Posterior cutaneous nerve of forearm: Innervates a strip of skin down the middle of the posterior forearm.



Wrist Drop:

Injury to the radial nerve is **commonly caused by a fracture of the midshaft of the humerus.** It results in loss of function in the extensors of the forearm, hand, metacarpals, and phalanges. It also results in the loss of wrist extension, leading to wrist drop, and produces weakness of abduction and adduction of the hand.

Note: When the radial nerve is injured in proximal humerus fracture triceps brachii muscle will be affected and patient presents with unable to extend at the forearm. While midshaft of humerus fracture triceps brachii will remain spared

Mechanism	Dislocation of the shoulder joint, fracture of proximal humerus	Fracture of midshaft of humerus	Forearm laceration	Fracture of radial head or posterior dislocation of radius
Motor Loss	The patient is unable to extend at the forearm, wrist and fingers. Unopposed flexion of wrist occurs, known as wrist-drop.	Loss of extension at wrist and fingers (triceps brachii spared)	None	Majority of the muscles in posterior forearm are affected. Wrist-drop does not occur, as the extensor carpi radialis longus is unaffected, and maintains some extension at the wrist.
Sensory Loss	Lower lateral arm, posterior arm, posterior forearm, dorsum of lateral hand and three and a half fingers	Dorsum of lateral hand and three and a half fingers (cutaneous branches of arm and forearm spared)	Dorsum of lateral hand and three and a half fingers	None
Signs	Wrist drop weak hand grip	Wrist drop, weak hand grip	None	Wrist drop not typically seen (extensor carpi radialis spared)

13 / 15

Why is albumin not freely filtered from the glomerular basement membrane during the process of glomerular filtration?

A. Albumin is too small in size



B. Albumin is negatively charged and is repelled by the negatively charged glomerular basement membrane

C. Albumin is positively charged and is repelled by the negatively charged glomerular basement membrane.

D. Albumin is selectively reabsorbed in the proximal convoluted tubules.

E. Albumin is broken down into smaller molecules before entering the glomerular filtration barrier.

- Glomerular basement membrane: Made up of matrix of extracellular negatively charged proteins and other compounds, help restrict the movement of negatively charged molecules across the basement membrane. e.g., Albumin
- Main site of ultrafiltrate
- The basement membrane consists of 3 layers: These layers help to limit the filtration of intermediate and large sized solutes e.g., Albumin.

High Yield:

Glomerular filtration barrier

A membrane that selectively allows the passage of molecules based on size and charge. Plasma is selectively filtered through glomerular capillary wall into the bowman's capsule (Ultrafiltrate = fluid filtered into bowman' space)



This barrier has three major components.

- 1: Glomerular capillary endothelium: It has fenestrations which allows plasma components with a molecular weight of <7000 Da to pass freely. These fenestrations actually do not restrict the movement of water and proteins or large molecules but instead prevent the filtration of blood cells (e.g. RBCs).
- Fenestrated endothelium has magnitude greater than proteins; in addition, the wall is covered with negatively charged compounds.
- 2: Glomerular basement membrane: Made up of matrix of extracellular negatively charged proteins and other compounds, help restrict the movement of negatively charged molecules across the basement membrane. e.g., Albumin
- Main site of ultrafiltrate
- The basement membrane consists of 3 layers: These layers help to limit the filtration of intermediate and large sized solutes e.g., Albumin.
- **3: Epithelial cell layer of podocytes:** Next to the bowman's space; the podocytes have foot processes directly contacting the basement membrane.
- Regular gaps between foot processes (pedicles) are called filtration slits, across these slits a protein network forms slit pores in the epithelial lining which prevent the passage of larger molecules through this final layer.
- Podocytes also exhibit phagocytic and contractile activity like that of mesangial cells.



A 35-year-old construction worker reports pain and swelling in the anatomical snuff box of his right hand after falling off a ladder and landing on his outstretched hand. You suspect injury of anatomical snuff box. Which one of the following carpal bones is most likely fractured?

A. Pisiform

B. Trapezium

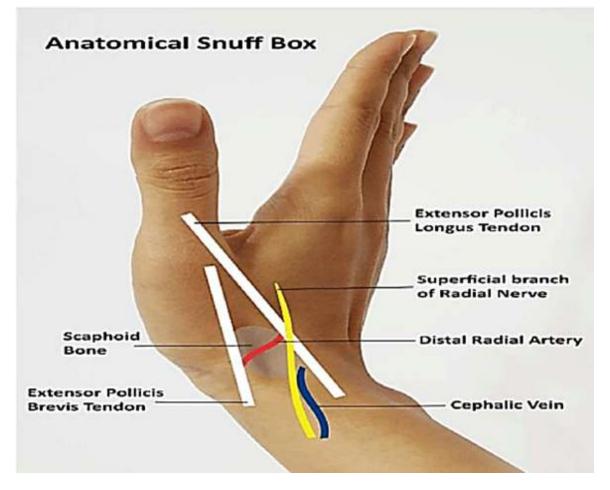
C. Lunate

D. Scaphoid

E. Navicular

An injury to the snuff box can potentially lead to a scaphoid fracture. Scaphoid fractures are relatively common in cases of wrist trauma, such as a fall onto an outstretched hand.





Anatomical snuffbox (High Yield)

• is a triangular depression found on the lateral aspect of the dorsum of the hand. It is best seen when the thumb is extended.



Anatomical Boundaries	Structures		
Medial border (Ulnar)	Tendon of extensor pollicis longus		
Lateral border (Radial)	 Tendons of the abductor pollicis longus and extensor pollicis brevis 		
Proximal border	Styloid process of radius		
Distal border	1st metacarpal		
• Floor	Scaphoid and trapezium bones		
• Roof	• Skin		
• Contents	 Radial artery, terminal portion of the superficial branch of the radial nerve, cephalic vein 		

Clinical Pearl:

Fracture of scaphoid bone: Falling on outstretched hand. The scaphoid bone of the hand is the most commonly fractured carpal bone.

Clinical feature: Pain and tenderness in the anatomical snuffbox.

15 / 15

A 10-year-old child presents with a rash and fever that have been present for the past 3 days. The rash started behind his ears and then spread to his face and body. He also has coryzal symptoms, a dry cough and conjunctivitis. You diagnose measles, what advice will you give to his mother regarding the most common complications of measles?





- B. Osteoarthritis
- C. Myocarditis
- D. Death
- E. Sub-acute sclerosing panencephalitis
- Pneumonia is the most common complication of measles can lead to severe respiratory infection
- Sub-acute pan encephalitis is rare but if in question stem asking serious complication involving CNS choose Sub-acute pan encephalitis.

Common	Uncommon		
Pneumonia	Encephalitis		
Diarrhoea	Myocarditis		
Croup	Pneumothorax		
Malnutrition	Pneumomediastinum		
Otitis media	Appendicitis		
Eye complications , Mouth ulcers	Subacute Sclerosing Pan Encephalitis (SSPE)		

<u> Measles: (High Yield)</u>

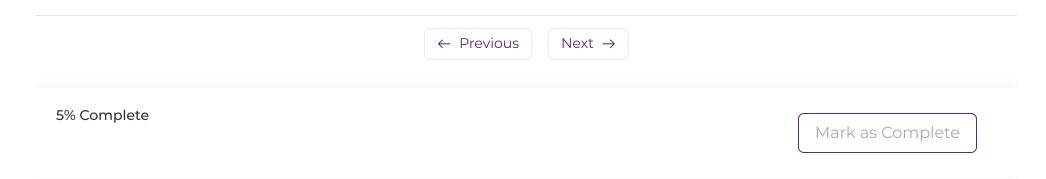
- **Acute** viral illness transmitted by respiratory droplets characterized by 3C Cough, coryza, conjunctivitis and fever.
- Measles rash: Maculopapular rash appearing first behind the ears and spreading to whole body.
- Incubation period: 9-12 days
- Infectious period: Patients are considered infectious for 3 days before the rash emerges and four days from onset of the rash.

• Patients are advised to stay away from school.



Treatment: Supportive

Complications: Pneumonia, bronchitis, otitis media, encephalitis, subacute sclerosing panencephalitis



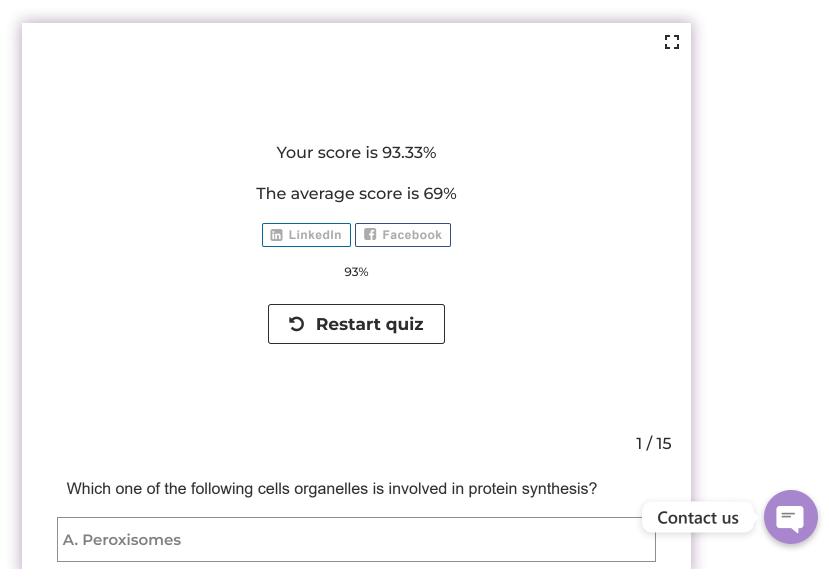


Mrcem Primary Complete Course ,High Yield Stuff and Similar to Previous Exam Questions With Explanation (For Diet 2)



Overview 🗗 Comments

About Lesson



B. Smooth endoplasmic reticulum

C. Rough endoplasmic reticulum



D. Golgi bodies

E. Lysosome

Cell organelles quick revision:

- 1: <u>Lysosomes</u> contains hydrolases responsible for digestion and breakdown of defective proteins
- Uterus and breast after pregnancy regress by lysosomes
- 2: <u>Mitochondria</u>: Powerhouse responsible for **production of chemical** energy in the form of ATP
- Unique feature in mitochondria is of own DNA.
- 3<u>: Endoplasmic reticulum:</u>
- Rough endoplasmic reticulum most likely synthesizes proteins.
- Detoxification of drug occurs in smooth endoplasmic reticulum.
- The smooth endoplasmic reticulum serves as a store for intracellular Ca2+ and is the major site of lipid production.
- 4: Golgi body: Secretory vesicles found
- The Golgi apparatus packages proteins for delivery to specific intracellular destinations or into vesicles which can then be secreted from the cell for extracellular action.
- 5: <u>Nucleus</u> contains genetic material and nucleolus responsible for ribosomes production.



• **6: Ribosomes:** Ribosomes are the cellular structures where protein synthesis takes place. They can be found in the cytoplasm (free ribosomes) or attached to the endoplasmic reticulum (bound ribosomes).

2/15

The anaesthetic team are called to the resus area of your ED to intubate a trauma patient. His age is 25. Following successfully intubating the patient they set up the ventilator and prepared to transfer him to ICU. What is the approximate tidal volume in an average sized, healthy young male?

A. 15 ml/kg

B. 17 ml/kg

C. 4 ml/kg

D. 20 ml/kg

E. 7 ml/kg 🕢

The tidal volume is the volume of air displaced between normal inhalation and normal exhalation. In a healthy, young adult male tidal volume is approximately 500 ml per inspiration or 7 ml/kg.

Lung volume and capacities (High



<u>Yield)</u>

<u>Tidal Volume (TV):</u> The volume of air that is inhaled and then exhaled with each normal breath.

Normal tidal volume is 500ml or 7ml/kg.

<u>Inspiratory Reserve Volume (IRV)</u>: The maximum volume of air that can be inhaled following and above a normal tidal inspiration.

• Normal Inspiratory reserve volume (IRV) is 3300ml.

<u>Expiratory Reserve Volume (ERV):</u> The maximum volume of air that can be exhaled from the resting expiration of tidal volume.

• Normal Expiratory reserve volume (ERV) is 1700ml.

Residual Volume (RV): The volume of air that remains in the lung following a maximum expiration.

- Residual Volume cannot be measured using spirometry.
- Normal residual volume is 1800ml.

Capacities

<u>Inspiratory Capacity</u> (IC): is the maximum volume of air that can be inhaled at the end of resting expiration.

• Inspiratory capacity is sum of IC= TV+ IRV

<u>Functional Residual Capacity</u> (FRC): the volume of air remaining in the lungs at the resting end-expiratory level or Volume remaining in the



lungs after tidal volume is expired in air.

- FRC is sum of: FRC= ERV+ RV
- FRC include Residual volume so FRC cannot be measured using spirometry.
- Normal FRC is 3500ml.

Factors affecting FRC.

- Factors increasing FRC: Emphysema, Air trapping in asthma, Ageing (due to loss of elastic properties) and Increasing height of patient.
- Factors decreasing FRC: Restrictive ventilatory defects e.g., pulmonary fibrosis, Posture lying supine, Increased intra-abdominal pressure (e.g., obesity, pregnancy, ascites) and Reduced muscle tone of diaphragm e.g., muscle relaxants in anesthesia, neuromuscular disease.

<u>Vital Capacity (VC)</u> is the maximum volume of air that may be exhaled following a maximum inspiration OR inhaled following a maximum expiration.

- VC= IRV+TV+ ERV OR VC= IC+ERV
- Normal VC in young adult (70kg) is 5500ml.

<u>Total Lung Capacity</u> (TLC) is the volume of air contained within the lungs following a maximum inspiration.

- TLC include Residual volume so it cannot be measured using spirometry.
- TLC= IRV + TV+ ERV + RV OR TLC= IC + FRC Or TLC = VC+ RV
- Normal TLC in young adult (70kg) is 7300ml.

Forced expiratory volume (FEV1)

• FEV1 is the volume of air that can be expired in the first second of a forced maximal expiration.





- FEV1 is normally 80% of the forced vital capacity, which is expressed as
- FEV1/FVC = 0.8
- <u>In obstructive lung disease</u> such as asthma and chronic obstructive pulmonary disease (COPD), both FEV1 and FVC are reduced, but FEV1 is reduced more than FVC. **FEV1/FVC ratio** is less than **0.7**.
- <u>In restrictive lung disease</u> such as fibrosis, both FEV1 and FVC are reduced, but FEV1 is reduced less than FVC is thus, Fev1 /FVC increased.

<u>Lung volume measurements and Peak</u> <u>Expiratory flow rate:</u>

- Lung volume can be measured with Spirometry.
- Residual volume cannot be measured using spirometry.
- Residual volume and thus (FRC and TLC) can be measured using helium dilution.

Peak Expiratory flow rate:

The easiest and quickest measurement is the peak expiratory flow rate (PEFR)

- Airway resistance and lung compliance can be assessed indirectly by measuring the forced expiratory flows and volumes.
- Lung volumes can be measured with spirometry.
- PEFR is reduced if airway resistance is increased in obstructive disease and is commonly used to monitor asthma.

3 / 15

Which one of the following vaccines is given in pregnancy considering selective immunization program in UK?



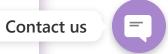
D. Inactivated influenza
C. Rota virus
B. Hepatitis B
A. DPT Vaccine

Selective immunisation programmes

Target group	Age and schedule	Disease	Vaccines required
Babies born to hepatitis B infected mothers	At birth, four weeks and 12 months old ^{1,2}	Hepatitis B	Hepatitis B (Engerix B/HBvaxPRO)
Infants in areas of the country with TB incidence >= 40/100,000	Around 28 days old ⁴	Tuberculosis	BCG
Infants with a parent or grandparent born in a high incidence country ³	Around 28 days old ⁴	Tuberculosis	BCG
Children in a clinical risk group	From 6 months to 17 years of age	Influenza	LAIV or inactivated flu vaccine if contraindicated to LAIV or under 2 years of age
Pregnant women	At any stage of pregnancy during flu season	Influenza	Inactivated flu vaccine
	From 16 weeks gestation	Pertussis	dTaP/IPV (Boostrix-IPV)

4/15

A 26-year-old man presents to the ED with a cut wound on his cubital fossa. Which muscles action will be preserved?



- A. Flexion of thumb
- B. Flexion of metacarpophalangeal joints
- C. Forearm pronation
- D. Opposition of thumb
- E. Flexion of small and ring fingers



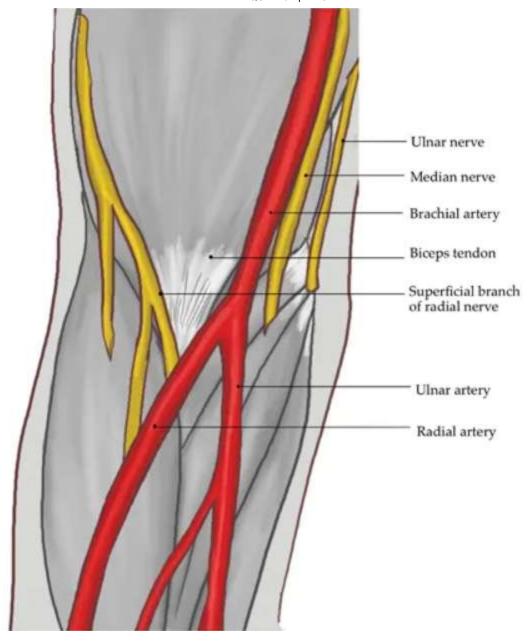
Deep laceration or cut wound can damage the contents of cubital fossa. Ulnar nerve will be preserved and its most likely injured in cubital tunnel.

Cubital fossa and its contents:



Superior	Imaginary line between two epicondyles
Medial	Pronator teres
Lateral	Brachioradialis
Contents	 From Medial to Lateral Median nerve Brachial artery Tendon of biceps Radial artery and nerve





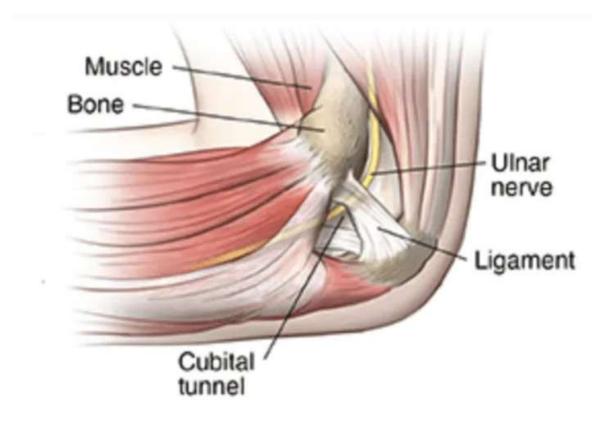
Note: (Clinical pearls)

• Supracondylar fracture is the most common distal humerus fracture in children. In Supracondylar fracture **anterior interosseous nerve**



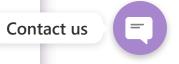
(branch of the median nerve), ulnar nerve or radial nerve can be damaged. The anterior interosseous nerve can be tested by asking the patient to make an 'OK' sign, testing for weakness of flexor pollicis longus. (Recall)

• Ulnar nerve descends behind medial epicondyle in a cubital tunnel where it is most commonly palpated and damaged.



5/15

A 40-year-old male was brought into the ED after he was found collapsed at home due to heroin overdose. He is in apnoea. Which one of the following respiratory centre is likely damaged?



- A. Cushing centre
- B. Apneustic centre
- C. Pneumotaxic centre



- D. Dorsal respiratory group
- E. Cerebral cortex
- Pneumotaxic center is located in the upper pons inhibits inspiration and, therefore, regulates both the rate (Increases) and pattern of breathing. Pneumotaxic center normally prevents excessive deep breathing, damage to pneumotaxic results in increase in depth of respiration (deep breathing) and decrease in respiratory rate/Apnoea
- The Apneustic center is located in the lower pons. Stimulates
 inspiration, producing a deep and prolonged inspiratory gasp
 (apneusis). Normally apneustic center promotes deep breathing,
 damage to apneustic center promotes shallow irregular/ Erratic
 breathing (Recall)

Note: Focus on the question stem, if they ask you normal functions of apneustic center or Pneumotaxic centre then your answer would be changed according to their normal functions and damaged clinical significance. For example: Normally apneusis/ Deep prolonged inspiration is induced by apneustic center while damage to apneustic center promotes shallow/irregular or erratic breathing.



6/15

A patient presents with difficulty breathing and diminished breath sounds on auscultation. The chest X-ray reveals lung collapse and further evaluation it was found lung surfactant is reduced. Which one of the following lung volumes affected?

A. Normal FVC

B. Low FEV1

C. FRC reduced

D. FEV1/FVC Low



E. High FVC

lung collapse, atelectasis and restrictive pattern frc decreases.

Factors affecting FRC.

- Factors increasing FRC: Emphysema, Air trapping in asthma, Ageing (due to loss of elastic properties) and Increasing height of patient.
- Factors decreasing FRC: Restrictive ventilatory defects e.g., pulmonary fibrosis, Posture - lying supine, Increased intra-abdominal pressure (e.g., obesity, pregnancy, ascites) and Reduced muscle tone of diaphragm e.g., muscle relaxants in anesthesia, neuromuscular disease, Lung collapse and atelectasis.



High Yield:

Obstructive lung disease	Restrictive lung disease
asthma, COPD, emphysema, bronchiectasis	Intrinsic causes: interstitial lung disease (Lung fibrosis), pulmonary oedema, pneumonia Extrinsic causes: pleural effusion, pneumothorax, chest wall deformities, neuromuscular disease, connective tissue disease and obesity Atelectasis can result from both intrinsic and extrinsic cause
Normal or low FVC	Low FVC
Low FEV1 (Recall)	Low FEV1
Low FEV1/FVC ratio (Recall)	High FEV1/FVC ratio
Low vital capacity	Low vital capacity
Residual volume high	Residual volume low
Total lung capacity Normal or high	Total lung capacity low

7/15

A 40-year-old male presents to the ED with infected surgical wound not healing and suture line separated. Which one of the following is the most likely reason for delayed wound healing?

A. Fibrin degradation

Contact us



B. Extra cellular matrix shortage

C. Decreased oxidative stress

D. Ongoing inflammation



E. Increased angiogenesis

Persistent inflammation, as a hallmark of chronic wounds, is connected to the dysregulation of the immune response during wound healing by various factors and leads to excessive levels of pro-inflammatory signals, reactive oxygen species (ROS), changes in the proteolytic balance, and an increased amount of matrix metalloproteinases (MMPs) that eventually cause damage to the extracellular matrix (ECM) and impaired epithelialization and proliferation of keratinocytes.

Wound healing (High Yield)

Healing is the process of replacing dead and damaging tissue with healthy tissue; this may occur through regeneration or repair.

The regenerative capacity of cells can be categorized in three main ways:

- Labile cells are constantly dividing and have a good capacity for regeneration, this allows the replacement of ageing tissue such as the surface epithelia of the skin, gastrointestinal tract and uterus; blood cells are derived from labile cells of the bone marrow.
- Stable cells slowly replicate e.g., cells of liver, renal tubular epithelium, Contact us endocrine glands.



• **Permanent tissues:** incapable of division and cannot be regenerated e.g., brain cells, myocardial cells, skeletal muscle cells.

Healing by primary intention:

- Healing of a clean, uninfected surgical incision approximated by surgical sutures.
- Day-1: Neutrophilic infiltration + fibrin clot
- Day-2: Epithelial cells from both edges have begun to migrate and proliferate along the dermis, yielding a thin but continuous epithelial layer.
- Day-3: Macrophages replace neutrophils Appearance of granulation tissue. Type III collagen deposition begins but do not bridge the incision.
- Day 5: Abundant granulation tissue Collagen fibrils bridge the incision.
- Neovascularization is maximum.
- Week-2: Dense scar tissue produced from granulation tissue contains type III collagen (weak collagen) that must be remodeled. Remodeling increases the tensile strength of scar tissue.
- 1 month: Replacement of collagen type III with collagen type I (has greater tensile strength) due to action of collagenase enzyme.
- The predominant collagen in adult skin is type I, whereas in early granulation tissue, it is type III.

Healing by secondary intention

Occurs in large wounds abscess formation and ulceration.

Main features:

- A larger clot or scab
- Inflammation: more intense Granulation tissue: much larger amount



- Scar tissue: greater mass
- Wound contraction: by myofibroblast e.g. Within 6 weeks, large skin defects may be reduced to 5% to 10% of their original size, largely by contraction.

Healing by tertiary intention

- Contaminated wound is initially treated with debridement and antibiotics followed by surgical wound closure (suture, skin graft replacement, flap)
- Note: Regarding the neat surgical scar after 2 months of surgery
 fibroblasts have predominant role
- Most important for delayed wound healing is due to infection.

Factors affecting wound healing:

Local factors affecting wound healing

- Mechanical injury
- Infection
- Edema
- Ischemia/necrotic tissue
- Topical agents
- lionizing radiation
- Low oxygen tension
- Foreign bodies

Systemic factors affecting wound healing

- Diabetes mellitus
- Anaemia
- Malnutrition



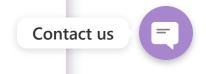


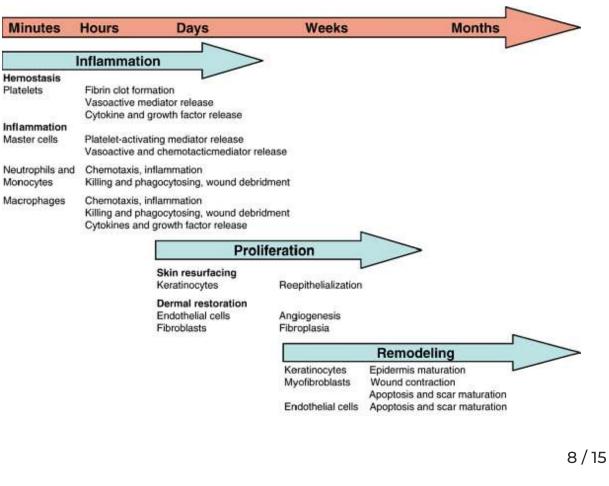
- Immunodeficiency
- Immunosuppressive medications
- Age
- Obesity
- Smoking
- Vit A, C and Zinc deficiency

Complications of Healing

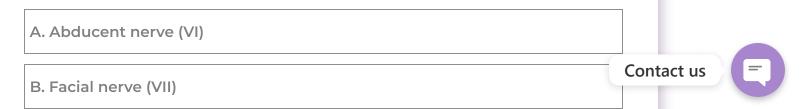
- Hypertrophic scar
- Keloid formation
- Failure to heal (abscess or empyema formation)
- Failure to unite (skin, muscle or fascia wound breakdown)
- Fracture complications

Remember the cells involved in different stages of wound healing.





A 45-year-old male presents to the ED after a recent cerebrovascular accident (CVA), the patient presents with dysphagia, struggling to swallow both solids and liquids. Upon examination, it is determined that the dysfunction has likely involved one of the cranial nerves, which one of the following nerves is most likely affected?



C. Vestibulocochlear nerve

D. Vagus nerve (X)

E. Hypoglossal nerve (XII)

Vagus nerve

originates in the **medulla oblongata** of the brain and leaves skull through jugular foramen together with CN IX and CN XI respectively.

Cranial Nerve	Vagus Nerve (CN X)
Cause of injury	jugular foramen syndrome, Trauma, neck surgery, tumors, aneurysms
Sensory function	Taste around epiglottis and pharynx Larynx, laryngopharynx, external ear, external acoustic meatus, Visceral sensation to heart and abdominal viscera
Motor function	Efferent pathway of gag reflex Muscles of soft palate except tensor veli palatini. Muscles of pharynx except stylopharyngeus Muscles of larynx, palatoglossus muscle of tongue, visceral efferent fibres to viscera of neck, thorax and abdomen
Assessment	Look for uvular deviation, gag reflex and swallowing
Clinical effects of injury	Dysarthria, dysphonia, dysphagia, stridor, loss of gag reflex, uvular deviation away from affected side

High yield:

Branches of vagus nerve:

<u>Superior laryngeal nerve</u>: innervate cricothyroid muscle and gives sensory innervation to laryngopharynx and superior part of the larynx



<u>Right Recurrent laryngeal nerve</u>: Hooks underneath right subclavian artery and ascends towards larynx and innervate muscles of larynx

<u>Left Recurrent laryngeal nerve</u>: Hooks underneath the arch of aorta, and ascends towards larynx and innervate muscles of larynx

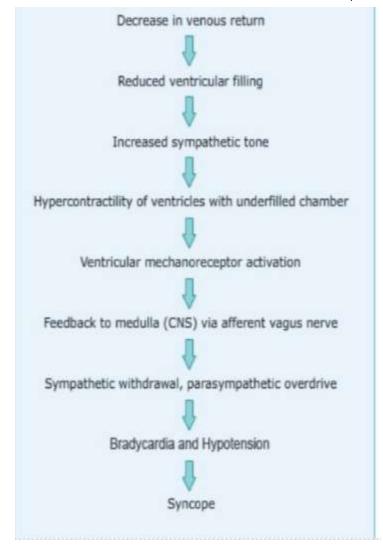
Clinical pearls:

<u>Vasovagal syncope</u>: Causes heart rate and blood pressure to drop suddenly during a period of emotional stress caused by initial increase in sympathetic outflow followed by a rebound reduction in sympathetic activity leaving unopposed parasympathetic activity causing vasodilatation, bradycardia, and hypotension

Orthostatic syncope: Defined as an orthostatic drop of >20 mm systolic blood pressure or >10 mm diastolic blood pressure. This may be due to absolute volume depletion from dehydration or haemorrhage or to venodilatation caused by medications or autonomic insufficiency (eg as occurs in Parkinsons disease).

Causes of syncope:





9/15

A Patient has a history of a rare genetic disorder affecting energy production. This disorder is maternally inherited and primarily involves a malfunction in which organelle?"



QUIZ : 34 MRCEM EXPERT	
A. Mitochondria	
B. Lysosome	
C. Endoplasmic reticulum	
D. Golgi apparatus	
E. Nucleus	
Mitochondria, as many mitochondrial disorders are maternally	

inherited due to the presence of mitochondrial DNA (mtDNA) in the egg cell.

10 / 15

A 35-year-old male was brought into the ED with dysphasia, contralateral sensory loss in the face and upper limb, and contralateral homonymous hemianopia. Which cerebral artery is most likely affected?

A. Middle Cerebral Artery (MCA)

B. Posterior Cerebral Artery (PCA)

C. Anterior Cerebral Artery (ACA)

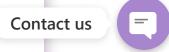


D. Vertebral Artery

E. Anterior choroidal artery

• MCA infarct leads to contralateral motor and sensory deficits usually face/Arm greater than leg

	Blood vessel	Clinical effects of occlusion of cerebral arteries	
	Anterior cerebral artery	 <u>Frontal lobe</u>: contralateral weakness in lower limb, dysarthria, dysphasia, apraxia and urinary incontinence <u>Parietal lobe:</u> contralateral somatosensory loss in the lower limb 	
)	Posterior cerebral artery	 Occipital lobe: contralateral homonymous hemianopia with macular sparing, cortical blindness (if bilateral) Temporal lobe: memory deficit Occipitotemporal region: prosopagnosia, and color blindness 	
	Middle cerebral artery	 Frontal lobe: contralateral weakness (face/arm greater than leg), conjugate deviation of the eyes to affected side, expressive dysphasia. Temporal lobe: deafness (if bilateral), receptive dysphasia, auditory illusions and hallucinations, contralateral superior quadrantanopia. Parietal lobe: loss of sensory discrimination, hemineglect, apraxia, contralateral inferior quadrantanopia (RECALL) 	



11 / 15

Which one of the following selective vaccines is given to health care professionals annually?

A. Influenza
B. Hepatitis B
C. Rota virus
D. Varicella vaccine
E. BCG Vaccine

Selected vaccines

- **BCG vaccine** is recommended for healthcare workers who may have close contact with infectious patients. It is particularly important to test and immunize staff working in maternity and paediatric departments and departments in which the patients are likely to be immunocompromised, e.g. transplant, oncology and HIV units.
- Hepatitis B vaccination is recommended for healthcare workers who
 may have direct contact with patients' blood or blood-stained body
 fluids.
- Influenza immunisation helps to prevent influenza in staff and may als reduce the transmission of influenza to vulnerable patients. Influenza



vaccination is therefore, recommended for healthcare workers directly involved in patient care, who should be offered influenza immunisation on an annual basis.

• Varicella vaccine is recommended for susceptible healthcare workers who have direct patient contact. Those with a definite history of chickenpox or herpes zoster can be considered protected. Healthcare workers with a negative or uncertain history of chickenpox or herpes zoster should be serologically tested and vaccine only offered to those without the varicella zoster antibody.

12 / 15

Regarding the anatomy of pituitary gland, pituitary fossa lies inferior to which one of the following structures?

A. Posterior clinoid process

B. tuberculum sellae

C. Diaphragm sellae

D. Dorsum sellae

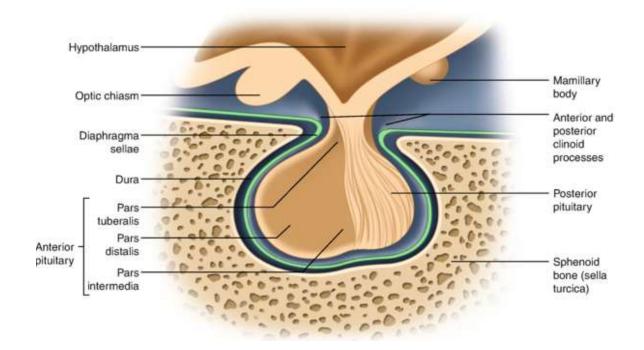
E. Pituitary stalk

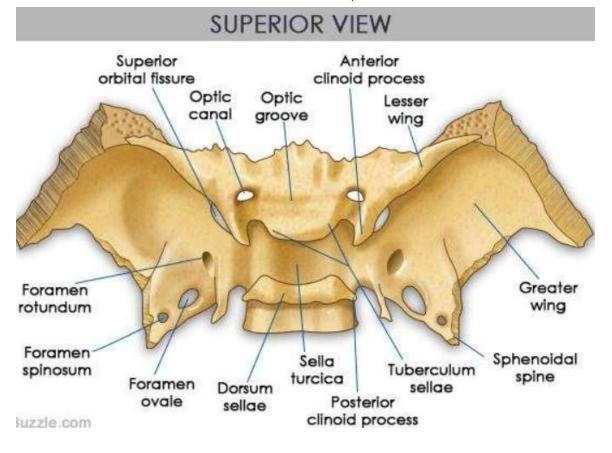
The pituitary gland is a pea-sized structure, suspended from the underside of the brain by the pituitary stalk known as the



infundibulum. It sits within a small depression in the sphenoid bone, known as the Sella turcica or the hypophyseal fossa or pituitary fossa

- The diaphragma sellae is a sheet of dura mater that forms the superior surface of the pituitary or hypophyseal fossa.
- Note: while the tuberculum sellae is a bony prominence on the superior surface of the Sella turcica. If they ask you, bony prominence on the superior surface of Sella turcica or pituitary fossa choose tuberculum sellae.





13 / 15

Which of the following is most important in eliciting a hyperventilatory response to changes in acidotic PH in CSF?

A. Stretch receptors

B. Apneustic centre

C. Peripheral chemoreceptors in the carotid body



D. Peripheral chemoreceptors in the aortic arch

E. Central chemoreceptor



- Central chemoreceptor in medulla is responsible for about 80% of the ventilatory response to changes in Pco2 (Increased Pco2) and decrease in PH (Acidosis).
- Peripheral chemoreceptors in carotid body/ Aortic arch respond to decrease in 02 and increase in arterial Pco2 and H+.

Control of ventilation is mediated via central and Peripheral chemoreceptors.

Chemoreceptor overview: (High Yield)

Chemoreceptor

- Carotid body and aortic body
- · Hypoxia, Hypercapnia and Acidosis
- IX (sinus nerve of Hering) and X (vagus)
- Medulla
- Sympathetic and parasympathetic
- Increases Ventilation (main) and increases BP also



<u>Central chemoreceptor Vs Peripheral</u> <u>chemoreceptor</u>

Central chemoreceptors (Central for CO2) only		Peripheral chemoreceptors (both CO2 and O2)	
(*) (*)	Respond to increase in PCO2 and decrease in PH Hypoxia can not stimulate central chemoreceptors	٠	Respond to increase in CO2 and H+ (Acidosis) and Decrease in Pao2 in arterial blood
٠	Keep PCO2 of CSF within normal limits		
	CO2 is lipid soluble readily crosses blood brain barrier, Increased PCO2 in CSF is rapidly sensed by central chemoreceptors and stimulate hyperventilation which washes out CO2 and ultimately decrease in CSF PCO2	•	Primary stimulus for peripheral chemoreceptors is hypoxia while increased PCO2 is the most sensitive stimulus

14 / 15

A 30-year-old female was brought into the ED after she had been trapped in burning house. She is cyanotic, Pulse oximetry reveals 100% Sa02. Which one of the following is common reason of pulse oximeter defect in clinical setup?

- A. Asthma
- B. Dark skin
- C. Methhaemoglobinemia
- D. COPD

E. Carboxyhaemoglobin





• CoHb (Carboxyhaemoglobin): Gives falsely high reading

- MetHb(Methemoglobinemia): Gives falsely low reading.
- Dark Skin: No effect

15 / 15

A mother is positive for hepatitis B surface antigen gives birth recently. Which of the following is the most appropriate next step for the baby?

- A. Treatment only if the baby tested positive for hepatitis B surface antigen
- B. Administration of hepatitis B vaccine
- C. Administration of hepatitis B immunoglobulin
- D. Administration of both hepatitis B vaccine and immunoglobulin



E. No treatment required

Administration of both hepatitis B vaccine and immunoglobulin-Transmission of hepatitis B infection to babies of infected mothers is reduced by 95% if both vaccine and immunoglobulin are given early.

Selective immunization schedule:

- Babies born to hep-B infected mother: Vaccine at birth, 4 weeks and 12 months.
- Usual site of Hep-B Vaccine is thigh.





Selective immunisation programmes

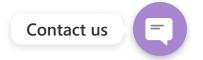
Target group	Age and schedule	Age and schedule Disease Vaccines requ			
Babies born to hepatitis B infected mothers	At birth, four weeks and 12 months old ^{1,2}	Hepatitis B	Hepatitis B (Engerix B/HBvaxPRO)		
Infants in areas of the country with TB incidence >= 40/100,000	Around 28 days old⁴	Tuberculosis	BCG		
Infants with a parent or grandparent born in a high incidence country	Around 28 days old ⁴	Tuberculosis	BCG		
Children in a clinical risk group	From 6 months to 17 years of age	Influenza	LAIV or inactivated flu vaccine if contraindicated to LAIV or under 2 years of age		
Pregnant women	At any stage of pregnancy during flu season	Influenza	Inactivated flu vaccine		
	From 16 weeks gestation	Pertussis	dTaP/IPV (Boostrix-IPV)		

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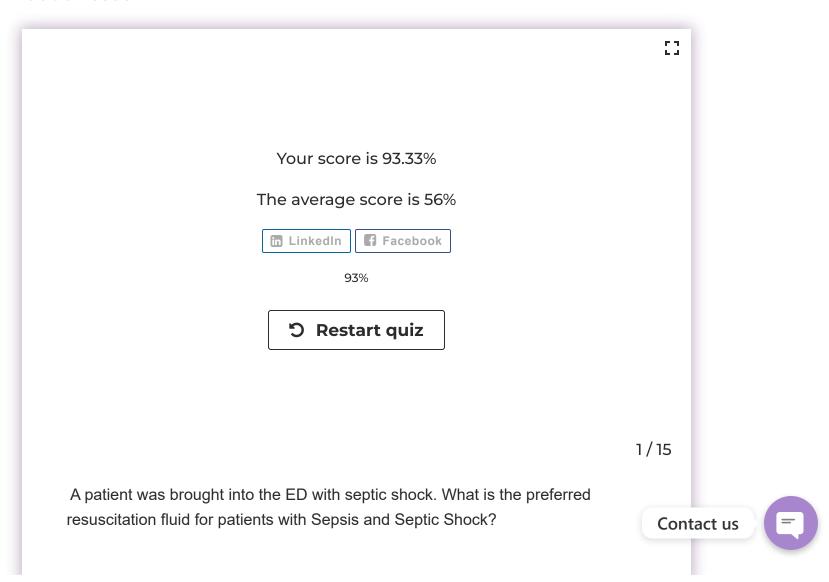
Mrcem Primary Complete Course ,High Yield Stuff and Similar to Previous Exam Questions With Explanation (For Diet 2)



Overview • 🖪

E Comments

About Lesson



A. Dextran	
3. Normal Saline 0.9%	

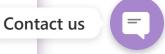
C. Albumin

D. Gelatins

E. Ringer's lactate

- Fluid resuscitation is a critical component to the emergency department (ED) management of patients with sepsis and septic shock. Fluids are administered to patients with sepsis in order to augment cardiac output and improve tissue perfusion and oxygenation. Recent evidence has suggested that the composition of fluids used in sepsis resuscitation may affect patient-centered outcomes.
- Crystalloid solutions remain the resuscitative fluid of choice for patients with sepsis and septic shock. Balanced crystalloid solutions may improve patient-centered outcomes and should be considered as an alternative to 0.9% normal saline (when available) in patients with sepsis. The use of albumin does not improve mortality in patients with sepsis of any severity. Hydroxyethyl starch solutions are associated with increased mortality and should not be used to resuscitate patients with severe sepsis or septic shock.

<u>High Yield:</u>



Fluids have traditionally been separated into crystalloid and colloid solutions. Crystalloid solutions can be further divided into balanced and unbalanced solutions. The term balanced solution is commonly used to refer to solutions that contain different electrolyte concentrations that more closely resemble the composition of plasma and minimally affect acid-base equilibrium. Examples of balanced solutions include Ringer's lactate, Ringer's acetate, Hartmann's solution, and Plasma-Lyte. In contrast, unbalanced solutions do not have physiologic concentrations of electrolytes and can adversely affect acid-base equilibrium. The most common unbalanced fluid solution is 0.9% normal saline (NS). Colloid solutions primarily include albumin, hydroxyethylstarch (HES) solutions, dextrans, and gelatins

2/15

A patient was brought into the ED with signs and symptoms of meningococcal disease, what advice will you give to staff members regarding post exposure prophylaxis?

- A. Indication of vaccine
- B. Wash hand with soap
- C. Perform blood and LP
- D. No indication

E. Antibiotics 🎻



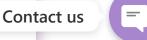
- Chemoprophylaxis (Antibiotics) is administered as soon as possible after exposure, ideally less than 24 hours after identification of an index patient.
- Rifampin, ciprofloxacin, and ceftriaxone are 90%-95% effective in reducing nasopharyngeal carriage of *N. meningitidis* and are all acceptable antimicrobial agents for chemoprophylaxis.
- The indications for chemoprophylaxis implementation are as follows.

Close contact with a patient within 7 days before the disease onset, regardless of vaccination status. "Close contact" applies to:

- Household members living with a sick person
- People who are in intimate contact with the patient
- People sleeping in the same bedroom with the patient (students, soldiers, officers)
- People who have been in direct contact with secretions from the patient's respiratory tract during medical procedures, including mouthto-mouth resuscitation, suctioning, and endotracheal intubation, before or less than 24 hours after antimicrobial therapy was initiated
- People traveling with the patient in the same plane, ship, bus, or car for longer than 8 hours
- **Note:** You will advise all to avoid close contact and if close contact has occurred chemoprophylaxis indicated in less than 24 hours.

3 / 15

Stimulation of muscarinic receptors by pilocarpine is competitively inhibited by which of the following medications?



A. Naloxone
B. Physostigmine
C. Edrophonium
D. Atropine
E. Pralidoxime

<u>Atropine</u>

Atropine antagonises the action of the parasympathetic neurotransmitter acetylcholine at **muscarinic receptors**. It therefore blocks the effects of the vagus nerve on both the SA node and the AV node, increasing sinus automaticity and facilitating AV node conduction.

Side effects: (Anti-muscarinic effects)

- Dry mouth
- · Nausea and vomiting
- Blurred vision
- Urinary retention
- Tachyarrhythmias

<u>Note:</u> Anti-muscarinic should be avoided in Myasthenia gravis, paralytic ileus, GI obstruction, Urinary retention and prostatic enlargement





Keloids, an abnormal overgrowth of scar tissue, are most commonly located on which part of the body?

A. Thigh and Hip

B. Chest and shoulders

C. Foot

D. Face and forehead

E. Abdomen and lower back

- Keloids can occur on any part of the body, but they are more commonly found on the chest, shoulders, chin, neck, lower legs and ear lobes.
- Keloids are raised, firm, frequently pruritic and painful, and generally do
 not spontaneously regress. A keloid is a growth of dense fibrous tissue
 that extends beyond the boundaries of the original wound. This is
 different from a hypertrophic scar, which is typically confined to the
 original wound borders and tends to flatten with time.





A 55-year-old man, experiences constant thirst, fatigue, and sudden weight loss. Medical tests reveal inhibited insulin secretion due to a genetic predisposition of type 2 diabetes. Which of the following is an inhibitor of insulin synthesis and secretion?

A. Sympathetic stimulation



B. Parasympathetic stimulation

C. Glycogen



D. Growth hormone

E. Secretin

Factors that stimulate insulin release include:

- Amino acids (arginine and leucine)
- Parasympathetic stimulation (via acetylcholine)
- Gastrin
- Secretin
- Cholecystokinin
- Glucagon
- Growth hormone
- Cortisol
- Glucagon-like peptide 1 (GLP-1)
- Gastric inhibitory polypeptide (GIP)

Factors that inhibit insulin release include:

- Reduced blood glucose
- Fasting
- Sympathetic stimulation
- Somatostatin

6/15

A 44-year-old woman presents to the with ED complaining of palpitations. She has recently been started on Amitriptyline by her GP. What is the mechanism of tachycardia in Amitriptyline overdose?





A. Muscarinic receptor blockade



B. Histamine receptor blockade

C. Sodium channel blockade

D. α-Receptor blockade

E. Potassium channel blockade

- Amitriptyline is in the tricyclic antidepressant (TCA) drug, block the reuptake of norepinephrine and serotonin from the synaptic cleft, thereby potentiating the effects of serotonin and norepinephrine on the postsynaptic receptors. The TCAs have also been shown to inhibit **muscarinic**, **histamine**, and α -adrenergic receptors, thereby leading to a host of undesirable side effects.
- Anticholinergic effects/parasympathetic blocking actions are due to muscarinic receptor blockade (leads to Tachycardia, urinary retention, blurred vision, acute angle closure glaucoma, confusion, constipation, and dry mouth

Note:

- Sedation (due to histamine receptor blockade)
- Postural hypotension (due to α adrenergic receptor blockade)
- cardiac arrhythmias (due to sodium channel blocker)



Which of the following is the first line therapy for gastroparesis in patients with diabetes?

A. Ondansetron

B. Metoclopramide

C. Omeprazole

D. Cimetidine

E. Cyclizine

- Metoclopramide is used to treat the symptoms of slow stomach emptying (gastroparesis)
- Metoclopramide relieves symptoms such as nausea, vomiting, heartburn, a feeling of fullness after meals, and loss of appetite.

Note: In anesthesia practice, medications that can be used to increase gastric emptying before general anesthesia include prokinetic agents.

One commonly used prokinetic agent for this purpose is metoclopramide. (Recall)



A patient with a history of heart failure is prescribed digoxin. Which one of the following ecg changes demonstrating the digoxin effect?

A. ST segment elevation

B. PR Prolongation

C. Peaked T waves

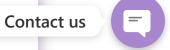
D. QT interval prolongation

E. Shortening of PR interval

Digoxin effect refers to the presence on the ECG of:

- Down sloping ST depression with a characteristic "reverse tick" appearance
- Flattened, inverted, or biphasic T waves.
- Shortened QT interval.
- PR Prolongation

High Yield:



Monitoring: Digoxin has narrow therapeutic index. Narrow therapeutic index means difference between the effective therapeutic dose and the potentially toxic dose is relatively small. This narrow window makes proper dosing and monitoring critically important to ensure the medication's safety, effectiveness and to prevent toxicity. The therapeutic plasma levels of digoxin are usually between 1.0-1.5 nmol/l. The likelihood of toxicity rises dramatically at levels above 2 nmol/l.

Dose adjustments in renal failure and liver failure:

Renal failure: Digoxin is excreted renally, and impaired renal function can cause increased digoxin levels and leads to digoxin toxicity. In this case the patient should have their digoxin dose reduced and their digoxin level and electrolytes should be carefully monitored.

<u>Liver failure</u>: Liver failure has little influence on digoxin metabolism or clearance; therefore, no dose adjustment is necessary.

<u>Digoxin toxicity:</u> Precipitated by hypokalemia or drugs causing hypokalemia, hypercalcemia, acidosis and renal failure.

The features of digoxin toxicity include:

- Hyperkaliemia
- Nausea, vomiting and diarrhea.
- Abdominal pain
- Confusion, dizziness and psychosis
- Tachyarrhythmias or bradyarrhythmia's
- Xanthopsia (yellow-green vision)



Treatment: Digoxin immune fab is the reversal agent (Antidote) of digoxin toxicity.

9/15

According to Uk immunization protocol Hep-B vaccine is given prophylactically in which one of the following patients?

- A. Diabetes
- B. Haemophilia
- C. CKD Stage 1
- D. Splenectomy patient
- E. Sickle cell disease



Selective immunisation programmes



Target group	Age and schedule	Disease	Vaccines required
Babies born to hepatitis B infected mothers	At birth, four weeks and 12 months old ^{1,2}	Hepatitis B	Hepatitis B (Engerix B/HBvaxPRO)
Infants in areas of the country with TB incidence >= 40/100,000	Around 28 days old4	Tuberculosis	BCG
Infants with a parent or grandparent born in a high incidence country ^a	Around 28 days old ⁴	Tuberculosis	BCG
Children in a clinical risk group	From 6 months to 17 years of age	Influenza	LAIV or inactivated flu vaccine if contraindicated to LAIV or under 2 years of age
Pregnant women	At any stage of pregnancy during flu season	Influenza	Inactivated flu vaccine
	From 16 weeks gestation	Pertussis	dTaP/IPV (Boostrix-IPV)

High Yield

- Although the risk of hepatitis B is low in the UK, children and adults in high-risk groups are also offered the vaccine.
- People who are at risk of getting hepatitis B or developing serious complications from it should consider being vaccinated.

These groups include:

- people who inject drugs or have a partner who injects drugs
- people who change their sexual partners frequently
- men who have sex with men
- babies born to infected mothers
- close family or sexual partners of someone with hepatitis B
- people who have regular blood transfusions or blood products, and their carers
- people with any form of chronic liver disease or chronic kidney disease
- people travelling to high-risk countries (Asia, Africa). Recall
- male and female sex workers



- people whose work puts them at risk of contact with blood or body fluids, such as nurses, prison staff, doctors, dentists and laboratory staff
- prisoners
- families adopting or fostering children from high-risk countries
- some foster carers
- people who live in accommodation for people with learning disabilities
- people who work with people with a severe learning disability

Fever in inflammation is mediated by which one of the following cytokines?

A. Tumor Necrosis Factor-alpha (TNF-α)

B. Interleukin-10 (IL-10)

C. Interleukin-6 (IL-6)

D. Interferon-gamma (IFN-γ)

E. Interleukin-1 (IL-1)

Interleukin functions:

Mnemonic: Fever Tablet Means Effective Antipyretics Action

- IL-1: Fever
- IL-2: T cell stimulator
- IL-3: Marrow stimulator



- IL-4: Ig**E** stimulator
- IL-5: Class switching to IgA
- IL-6: Stimulates Acute Phase Protein Production

A 45-year-old male patient with a history of chronic alcohol abuse is admitted to the emergency department exhibiting symptoms of severe alcohol withdrawal, the medical team decides to administer Prochlorperazine. What is the main mechanism of action of Prochlorperazine?

- A. Dopamine-D2 agonist
- B. Serotonin-5HT3 antagonist
- C. Histamine-H1 antagonist
- D. Histamine-H2 antagonist
- E. Dopamine-D2 antagonist



Prochlorperazine are **dopamine-D2 receptor antagonist** and act centrally by blocking the chemoreceptor trigger zone.

Anti-psychotics (High Yield)

Anti-psychotics acts by blocking dopamine D2 receptors in the brain.



Side effects:

Extrapyramidal side effects occur most commonly associated with antiemetic (metoclopramide, prochlorperazine) and anti-psychotics (haloperidol). **Haloperidol is the most** common causative antipsychotic drug.

- Dystonia (abnormal face and body movements) most commonly occur in young female and children treated with Procyclidine or benztropine.
- Tardive dyskinesia (rhythmic, involuntary movements of tongue, face and jaw)
- Other side effects:
- Parkinsonian symptoms (Tremor, Rigidity, bradykinesia and postural instability)
- Hyperprolactinemia (Dopamine inhibits release of prolactin)
- QT-interval prolongation

12 / 15

A patient was prescribed an antacid by his GP presents with a complaint of constipation. Which of the following antacids is more likely to be associated with constipation as a side effect?

A. Carbonate

B. Calcium carbonate

C. Sodium bicarbonate



D. Aluminum hydroxide 🕡

E. Magnesium hydroxide

Antacid Side Effects:

Antacids are relatively harmless, but they can cause rare side effects.

- Aluminum compounds can cause constipation by reducing bowel motility.
- Magnesium Compounds may cause diarrhea.
- Carbonates may generate carbon dioxide leading to bloating and flatulence

13 / 15

Which of the following errors is considered if the researcher states that there is no difference when one exists?

A. Type 1 error

B. Type-4 error

C. Type III error

D. Type II error



Examples of Type 1 and Type 2 errors: (In simple type 1 is false positive and type 2 is false negative.

- Researcher states that there is no difference when one exists that means there is actual difference, and researcher made a mistake is type 2 error.
- Researcher states that there is difference when it does not exist that means there is no difference, and researcher made a mistake is type 1 error.
- Example of fire alarm: False firearm leading to inconvenience. (Creates trouble but actually the alarm is false is type 1 error.
- Missed fire alarm leading to disaster is type-2 error.
- Type I error (false positive): the test result says you have coronavirus, but you actually don't.
- Type II error (false negative): the test result says you don't have coronavirus, but you actually do.

14 / 15

A 64-year-old woman presents to the hospital with an acutely painful, red, hot, swollen big toe. He has a past medical history of gout, diabetes mellitus, and severe heart failure. Gout is Diagnosed, you plan on commencing her on Colchicine. Which of the following is most common side effect of Colchicine?

A. Gastrointestinal disturbance



B. Bleeding



C. Muscle paralysis
D. Ulcer
E. Anemia

- Gastrointestinal disorders are the most common adverse reactions with colchicine, these include **nausea**, **vomiting**, **abdominal pain**, and particularly **diarrhea**.
- Colchicine acts to induce microtubular depolymerization by Binding tubulin, thereby leading to decreased activation, Migration, and degranulation of neutrophils to the affected site.(RECALL)
- In patients with CVD or HF who present with an acute gout flare, colchicine is considered safe and potentially reduces the risk of myocardial infarction (RECALL)

A 45-year-old patient is scheduled to undergo elective knee arthroscopy due to persistent joint pain. The anesthesiologist decides to administer Bupivacaine, a local anesthetic, to manage perioperative pain effectively. The primary mechanism of action of Bupivacaine is?

A. blockage of Magnesium channels

B. Stimulation of voltage-gated N-type calcium channels



C. Blockade the GABA-gated chloride channels

D. Activation of ligand-gated potassium channels

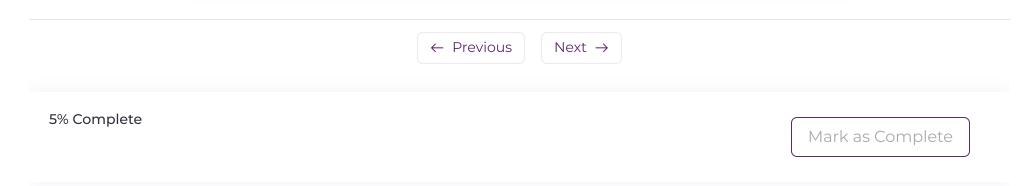
E. Blockade of voltage-gated sodium channels

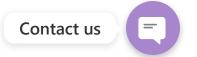


The local anesthetics (Bupivacaine) work by blocking voltage-gated Na+channels in nerve cell membranes, thus inhibiting the influx of sodium ions and preventing the initiation and conduction of nerve impulses.

Local anesthetic drugs: (High Yield)

Lidocaine	Prilocaine	Bupivacaine
Most widely used local anesthetic. Lidocaine tends to cause vasodilatation. This is due to inhibition of action potentials via sodium channel blocking vasoconstrictor sympathetic nerves. Lidocaine may also be given in treatment of ventricular arrythmia due to its properties of inhibiting voltage gated Na channels. The half-life of lidocaine is 1.5-2 hours. Its onset of action is rapid within a few minutes, and it has a duration of action of 30-60 minutes when used alone. Its duration of action is prolonged by coadministration with adrenaline. Adrenaline is vasoconstrictor, it prolongs the action of local anesthetics.	Local anesthetic drug used widely in Bier's block. EMLA cream is mixture of 50% lidocaine and 50% prilocaine and can be used to numb the skin before performing a venipuncture	Bupivacaine can be used as an epidural or spinal anesthetic during childbirth to numb the lower part of the body. Other uses: Local anesthetic in surgical procedures where longlasting pain relief is required and post operative pain management. Local anesthetic toxicity: Sedation, Hypotension, Bradycardia, Myocardial depression, tremors, visual disturbance Antidote: Intralipid emulsion therapy: used widely in L.A toxicity.





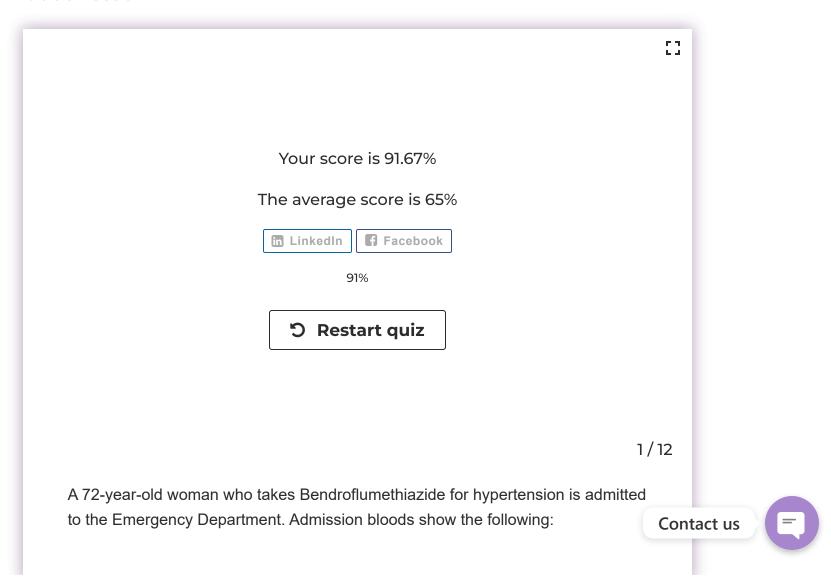
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Overview •

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About Lesson



- Na 131 mmol/l
- K: 2.2 mmol/l
- Urea 3.1 mmol/l
- Creatinine56 µmol/l
- Glucose:4.3 mmol/l

Which one of the following ECG features is most likely to be seen?

A. Short PR interval

B. U waves

C. Flattened P waves

D. Short QT interval

E. J waves

ECG features of hypokalemia

- U waves
- small or absent T waves (occasionally inversion)
- prolong PR interval.
- ST depression
- long QT (QT prolongation)



Note: J waves are seen in hypothermia whilst delta waves are associated with Wolff Parkinson White syndrome.

2/12

A patient presents to the emergency department with a penetrating injury just inside the bowel wall. The next layer involved is the?

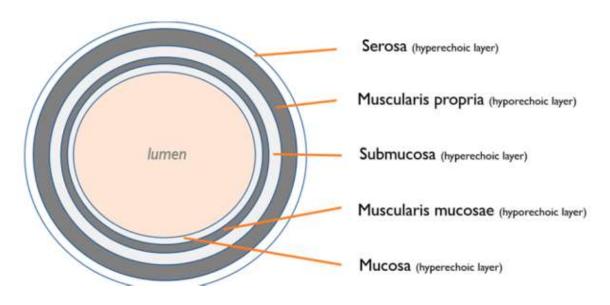
A. Muscularis propria
B. Submucosa
C. Mucosa
D. Subserosa
E. Serosa

In this scenario, the injury has penetrated just inside the bowel wall, indicating that it has breached the serosa layer. The next layer, which is affected by the injury, is the muscularis propria.

The layers of the GI tract, from outermost to innermost

- Serosa or adventitia lined with visceral peritoneum.
- Muscularis propria
- Submucosa
- Mucosa





High yield:

Anterolateral abdominal wall layers:

- Skin
- Subcutaneous tissues (further divided into the superficial Camper's fascia and the deeper Scarpa's fascia)
- External oblique muscle
- Internal oblique muscle
- Transversus abdominis muscle
- Transversalis fascia
- Parietal peritoneum

Note: The mucosa is the innermost layer responsible for absorption and secretion in the digestive process. If they ask you in simple inner



most layer choose mucosa or outer most bowel wall layer choose serosa.

3/12

A 45-year-old patient presents with symptoms such as fatigue, weight loss, low blood pressure, and increased pigmentation of the skin. Laboratory tests reveal deficient adrenal hormone levels. What is the reason for skin darkening in this patient due to Addison's disease?

- A. Skin darkening is unrelated to Addison's disease and might be due to other factors.
- B.: Excessive melanin production stimulated by decrease in aldosterone
- C. Excessive melanin production stimulated by increased ACTH levels.



- D. Decreased melanin production caused by adrenal hormone deficiency.
- E. Skin darkening is a result of high cortisol levels suppressing melanin production.

In Addison disease the adrenal glands don't make enough cortisol and aldosterone, a steroid hormone that regulates salt and water balance. The low level of cortisol triggers the release of another hormone called adrenocorticotropic hormone (ACTH). High ACTH leads to high levels of



melanin, the chemical that gives skin its color and causes skin discoloration known as hyperpigmentation/bronzing.

4/12

Relatively higher dose of aminophylline is required to attain therapeutic plasma concentration in which one of the following patients?

- A. Those receiving cimetidine
- B. Congestive heart failure patients
- C. Smokers
- D. Hepatic impairment



E. Infection

- In smokers increased clearance and the decreased half- life of theophylline, and in order to prevent the nighttime life-threatening attacks, it is necessary to recommend maximal doses of theophylline.
- Theophylline/aminophylline is metabolized in the liver, and has a narrow therapeutic index. The plasma theophylline concentration is decreased in smokers, and by alcohol consumption.
- Note: The plasma theophylline concentration is increased in heart failure, hepatic impairment, infections, fever and in the elderly, **reduction** in dosage may be necessary to avoid toxic accumulation.



Bronchodilator therapy:

Remember theophylline mechanism of action as well as indications and adverse effects.

Drug	Clinical uses	Side effects
Anti- muscarinic/cholinergic	Ipratropium: Blocks vagally mediated bronchoconstriction. • Short term relief of asthma/COPD delivered via inhaler	Dry mouth, Constipation, Urinary retention, Blurred vision, tachycardia, reduced bronchial secretions and acute closed angle glaucoma
Beta 2 agonist	Salbutamol/terbutaline: Acts directly on smooth muscle cells relaxation and bronchodilation. Short term relief of bronchospasm in acute asthma/COPD delivered via inhaler. Act shortly and more potent than ipratropium.	Vasodilatation +/- hypotension low dose has 32 effects Hypokalemia stimulates Na+/K+-ATPase transporting K+ into cells Tachycardia (high dose has B1 effects) Others: Seizures, headache and QT interval prolongation.
Theophylline	Theophylline: Theophylline acts by inhibition of phosphodiesterase and therefore inhibits the metabolism of cyclic AMP results in increased tissue concentration of cyclic AMP. • Used in severe or life threatening asthma. • Not generally used in exacerbation of COPD.	Theophylline: Has narrow therapeutic index Therapeutic plasma level is 10-20mg/liter Side effects include: • Palpitations and tachycardia • Headache • Insomnia • Hypokalemia (additive to 62 agonists) Levels above 20mg/liter can produce toxicity • Cardiac arrhythmias including VF • Tremor and seizures • Nausea, vomiting and • Rhabdomyolysis

5/12

A 40 year old lady patient arrives in the ED complaining of severe right hypochondrium pain. The diagnosis points towards acute cholecystitis. What hormone plays a pivotal role in triggering gallbladder contractions, contributing to the pain in this condition?

A. Cholecystokinin (CCK)





B. Gastrin

C. Glucagon

D. Insulin

E. Somatostatin

Right hypochondrium pain due to Cholecystitis is primarily caused by increased levels of Cholecystokinin (CCK). This hormone is released in response to the presence of fatty foods, stimulating the contraction of the gallbladder and leading to heightened pressure, contributing to the pain in the upper right abdomen.

6/12

A 35-year-old male presents to ED with sudden-onset hypertension, severe headache, and palpitations. The patient is diaphoretic, and a computed tomography (CT) scan reveals an adrenal mass consistent with Pheochromocytoma. The primary mechanism responsible for the symptoms in this patient involves the activation of?

A. Dopamine receptors

B. Serotonin receptors



C. GABA receptors

D. Alpha-1 adrenergic receptors



E. Beta-2 adrenergic receptors

Pheochromocytoma is a rare adrenal gland tumor that can produce excessive amounts of catecholamines, including adrenaline and noradrenaline. The symptoms of Pheochromocytoma are mainly attributed to the effects of elevated catecholamines. Activation of alpha-1 adrenergic receptors plays a key role in the manifestation of symptoms such as hypertension, headache, and diaphoresis. Therefore, the primary mechanism responsible for pheochromocytoma symptoms is the stimulation of alpha-1 receptors by increased catecholamines.

Treatment of Pheochromocytoma (High Yield):

- Definitive treatment is by surgical resection of the tumor.
- Prior to surgery, acute crises are treated medically to control the effects of excess catecholamines.

Medical therapy consists of:

- Alpha blocker (phenoxybenzamine), followed by
- Beta blocker (propranolol). Beta adrenoceptor blockade can be instituted to control tachycardia.
- Beta blockers must never be given before alpha-blocker as this may cause a paradoxical rise in blood pressure due to unopposed a-



mediated vasoconstriction.

7/12

A 50-year-old man is brought to the emergency room after a head injury caused by a fall. He is disoriented and experiencing severe nausea. Initial tests reveal low sodium levels (126 mEq/L) and concentrated urine, suggesting SIADH. Which hormone is elevated in this patient due to the head injury, leading to the development of SIADH symptoms?

A. Vasopressin
B. Aldosterone
C. Thyroxine
D. Cortisol
E. Insulin

- The Syndrome of inappropriate antidiuretic hormone secretion (SIADH) is characterized by a physiologically inappropriate release of Antidiuretic hormone(vasopressin) either from the posterior pituitary gland, or an abnormal non-pituitary source.
- In most patients with head Injury, hyponatremia is a feature of the syndrome of inappropriate antidiuretic hormone (SIADH) secretion due to pituitary dysfunction after head injury.



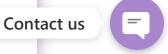
A Patient presents to ED with uncontrolled high blood pressure and electrolyte imbalances. Nephrologists suspect dysregulation in the juxtaglomerular cells secretions. Extensive tests reveal overactive JG cells. Which of the following is secreted by JG cells?

A. Cortisol
B. ADH
C. Renin 🗸
D. Aldosterone
E. ACTH

Renin is produced and stored in granular juxtaglomerular (JG) cells, which are modified aortic smooth muscle cells found in the media of afferent arterioles mainly.

Renin angiotensin aldosterone system (High Yield)

• The Renin-Angiotensin-Aldosterone System (RAAS) is a hormone system within the body that is essential for the regulation of blood



- pressure and fluid balance. The system is mainly comprised of the three hormones renin, angiotensin II and aldosterone.
- A fall in CPV (reflecting blood volume) is detected by atrial and other cardiopulmonary stretch receptors. Fall in blood volume sufficient to reduce the blood pressure activates the baroreceptor reflex which in turn causes increased sympathetic stimulation resulting in Renal vasoconstriction decreasing the GFR.
- ADH release causing H2O reabsorption.
- Renin release from granular cells of JG apparatus
- Peripheral vasoconstriction resulting in increased total peripheral vasoconstriction.

Renin Release

The first stage of the RAAS is the release of the enzymerenin. Renin released from granular cells of the renal juxtaglomerular apparatus (JGA) in response to one of three factors:

- Reduced sodium delivery to the distal convoluted tubule detected by macula densa cells.
- Reduced perfusion pressure in the kidney detected by baroreceptors in the afferent arteriole.
- Sympathetic stimulation of the JGA via β1 adrenoreceptors.
- Decreased GFR
- Decreased ECF volume, arterial blood pressure or CVP.

Note: The release of renin is inhibited by **atrial natriuretic peptide (ANP)**, which is released by stretched atria in response to increases in blood pressure.





Angiotensin II production

Angiotensinogen is a precursor protein produced in the liver and cleaved by renin to form angiotensin I. Angiotensin I is then converted to angiotensin II by angiotensin converting enzyme (ACE). This conversion occurs mainly in the lungs where ACE is produced by vascular endothelial cells, although ACE is also generated in smaller quantities within the renal endothelium.

Functions of angiotensin II

- Angiotensin 2 acts on AT1 receptors found in the endothelium of arterioles throughout the circulation to achieve vasoconstriction. The net effect of this is an increase in total peripheral resistance and consequently, blood pressure.
- Angiotensin II acts at the hypothalamus to stimulate the sensation of thirst, resulting in an increase in fluid consumption. This helps to raise the circulating volume and in turn, blood pressure.
- It also increases the secretion of ADH from the posterior pituitary gland resulting in the production of more concentrated urine to reduce the loss of fluid from urination.
- Angiotensin II acts on the adrenal cortex to stimulate the release
 of aldosterone from zona glomerulosa of the adrenal cortex. Which in
 turn causes increased Na reabsorption and K loss. It also stimulates the
 sympathetic nervous system to increase the release of noradrenaline
 (NA). which in turn increases cardiac output, release of renin,
 vasoconstriction of arterioles.
- Causes vasoconstriction of renal arterioles predominantly efferent arterioles thereby maintaining or increasing the GFR



- Activation of Na-H pump thereby increasing the reabsorption of Na from proximal tubule.
- Inhibits the renin production from granular cells of JG apparatus (negative feedback)

A 40-year-old patient brought to the ED following a road traffic accident. CT scan reveals retroperitoneal bleeding. Which of the following anatomical structure is involved?

- A. Spleen
- B. Tail of pancreas
- C. Sigmoid colon
- D. Appendix
- E. 3rd part of duodenum



- A useful mnemonic to remember which organs are retroperitoneal is
 SAD PUCKER
- S = Suprarenal (adrenal) Glands
- A = Aorta and inferior vena cava
- D = Duodenum (2nd and 3rd part)
- P = Pancreas (except the tail)
- U = Ureters





- C = Colon (ascending and descending parts)
- K = Kidneys
- E = Esophagus
- R = Rectum

When the Renin-angiotensin-aldosterone system is activated, it plays a crucial role in regulating renal blood flow and filtration in response to various physiological signals. Angiotensin-II, a key component of this system, increases Glomerular Filtration Rate (GFR) by which mechanism?

A. Inhibition of tubular reabsorption

B. Constriction of efferent arterioles



C. Dilatation of afferent arterioles

D. Relaxation of Glomerular capsule

E. Dilatation of efferent arterioles

Angiotensin-II (AT-II) preferentially constricts renal efferent arterioles, resulting in increased glomerular filtration rate (GFR) and decreased renal plasma flow (RPF). Thus,

Angiotensin II production (High Yield)



Angiotensinogen is a precursor protein produced in the liver and cleaved by renin to form angiotensin I. Angiotensin I is then converted to angiotensin II by angiotensin converting enzyme (ACE). This conversion occurs mainly in the lungs where ACE is produced by vascular endothelial cells, although ACE is also generated in smaller quantities within the renal endothelium.

Functions of angiotensin II

- Angiotensin 2 acts on AT1 receptors found in the endothelium of arterioles throughout the circulation to achieve vasoconstriction. The net effect of this is an increase in total peripheral resistance and consequently, blood pressure.
- Angiotensin II acts at the hypothalamus to stimulate the sensation of thirst, resulting in an increase in fluid consumption. This helps to raise the circulating volume and in turn, blood pressure.
- It also increases the secretion of ADH from the posterior pituitary gland resulting in the production of more concentrated urine to reduce the loss of fluid from urination.
- Angiotensin II acts on the adrenal cortex to stimulate the release
 of aldosterone from zona glomerulosa of the adrenal cortex. Which in
 turn causes increased Na reabsorption and K loss. It also stimulates the
 sympathetic nervous system to increase the release of noradrenaline
 (NA). which in turn increases cardiac output, release of renin,
 vasoconstriction of arterioles.
- Causes vasoconstriction of renal arterioles predominantly efferent arterioles thereby maintaining or increasing the GFR
- Activation of Na-H pump thereby increasing the reabsorption of Na from proximal tubule.



 Inhibits the renin production from granular cells of JG apparatus (negative feedback)

producing a net increase in filtration fraction (Filtration Fraction = GFR/RPF).

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Which of the following statements about case-control studies is correct?

- A. They provide more evidence for causal inference than a randomised controlled trial
- B. They are usually shorter in duration than prospective cohort studies



- C. They are usually longer in duration than prospective cohort studies
- D. They are usually more expensive to run than a randomised controlled trial
- E. They are a type of experimental study
- case-control study is a type of observational study in which two groups of patients, one with the disease and one without, are compared on the basis of a proposed causative factor that occurred in the past. They are therefore retrospective in nature and are useful in hypothesis generation.



- They are suitable to be used when investigating a rare disease or as a preliminary study in cases where Little is known about the disease and the proposed aetiological factor. They can look at multiple risk-factors (exposures) but can only look at a single outcome.
- Compared with randomised controlled trials, case-control studies are generally relatively inexpensive to run but provide less evidence for causal inference.
- Compared with prospective cohort studies, case-control studies are usually less expensive and also shorter in duration.

A 45-year-old patient was brought into the emergency department after a penetrating injury involved outermost layer of the bowel wall, which layer is likely affected?

A. Muscularis propria

B. Submucosa

C. Serosa

D. Subcutaneous tissue

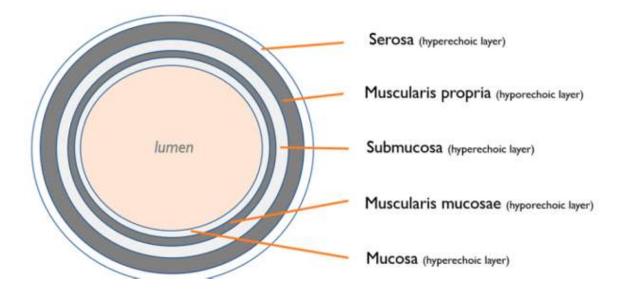
E. Mucosa

The layers of the GI tract, from outermost to innermost



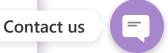
- Serosa or adventitia lined with visceral peritoneum
- Muscularis propria
- Submucosa
- Mucosa

Note: If they ask you penetrating injury just outside of the bowel wall that refers injury has not breached serosa (Outer layer) in that case parietal peritoneum is appropriate



Anterolateral abdominal wall layers: (High Yield)

- Skin
- Subcutaneous tissues (further divided into the superficial Camper's fascia and the deeper Scarpa's fascia)
- External oblique muscle
- Internal oblique muscle
- Transversus abdominis muscle
- Transversalis fascia



• Parietal peritoneum

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5% Complete

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